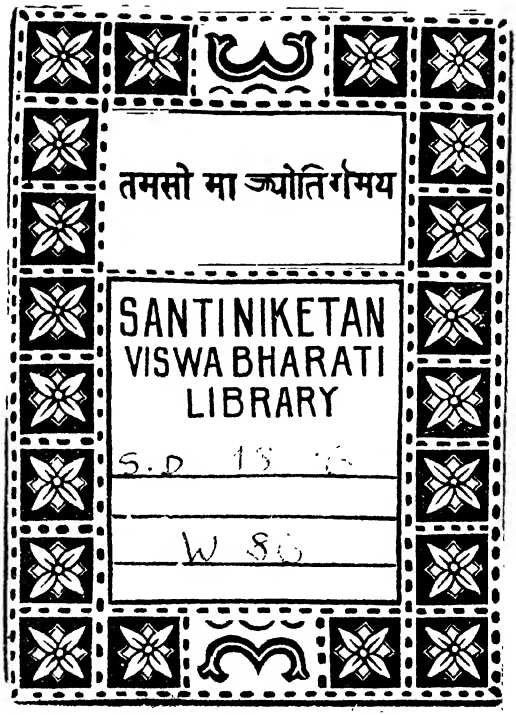
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THE WORLD AS POWER

POWER AS MATTER

BY THE SAME AUTHOR

THE WORLD AS POWER

Power as Reality

Power as Life (Prāna-Shakti)

Power as Mind (Mānasī-Shakti)

Power as Matter (Bhūta-Shakti)

Power as Causality and Continuity

Power as Consciousness (Chit-Shakti)
(In Preparation)

also

Shakti and Shakta (2nd Ed.)

Garland of Letters

Bharata Shakti (3rd Ed.)

Seed of Race (2nd Ed.)

Is India Civilized (3rd Ed.)

THE WORLD AS POWER

POWER AS MATTER

BY
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AND
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PREFACE

THIS volume treats of an important subject, for many persons find a difficulty in understanding the Vedāntic doctrine as regards Matter. Others affirm that there is no such thing as Matter. It can be easily understood if we remember that Matter like Mind is potentially in, and is actually a form of, the ultimate Reality which is the *Pūrna* or the Complete, the Full, the Whole, the infinite reservoir of Energy which appears as the Universe. It is there, as it is here. How? Not of course as the gross Matter which is the object of the finite experiencer. Such matter has no existence apart from the finite centre which experiences it. Then again it is asked "how and in what way?" Scientific or conceptual matter as now understood in the West is reduced to electrons and protons or units of electric charge which again are, according to some, strain forms in, and of, an ultimate substance or Æther, and which in any event are forms of

Universal Energy. But what we objectively perceive as Energy is subjectively Will. Each limited centre is a manifestation of Energy and a source of it within the universal scheme of which it is a part. But that whole scheme is a manifestation of the Supreme Will, Power or *Shakti* appearing as the Universal Energy in all its various forms. Ultimately then Matter is Supreme Power or *Mahāshakti*. In dissolution Matter, whether gross or subtle, resolves itself into potentiality or tendency (*Sangskāra*). It then is in the Power of the Supreme Reality as a tendency towards manifestation. Tendency of what? Of *Chit-Shakti* as the Supreme Experience. The tendency is Power which is then one with *Chit*. What we call Matter is then the Self as its own object. The Self is subject and the Self is object. The object or matter is not, as in the case of the limited centre, something other than, outside of, and separate from, the subject. When the Self knows its object as other than itself there is creation or *Srishti*. But "creation" is not for the first time. It is eternal and recurrent. Matter then is eternal, though it has two forms as seed and fruit. The seed is tendency in the supreme and

infinite Reality to appear as Matter to the finite centre. It is potential energy or unmanifested Power. The fruit is that tendency realised as Matter and the Mind which experiences it. It always *is* as the power to become of Being, and recurrently *exists* as that Power manifested as psychic, vital and physical Energy in the form of Mind, Life and Matter. We do not thus let go of Matter (in one sense or another) at any time. The Finite Centre senses it now as something other than the Self. The Infinite Whole in which these centres exist experiences it as Itself. For the Power to appear as mind and matter is one with the Power-holder (*Shaktimān*).

In the same way Mind ever is as seed or fruit. As fruit it is limited *Chit* or Consciousness which has, as its objects, Matter and all forms constituted of it. As seed it is the Power (*Shakti*) which is then one with unlimited Consciousness (*Chit*). The complete I (*Pūrṇāham*) is Experience as the Whole in which there is no separate subject and object but the Self knows and feels, that is loves, the Self, in which Self as Power is the potency of limited experience as the finite selves and their separate

objects. The experience of the limited "I" (*Aham*) is an experience of a self as separate from its object or Matter which it knows and feels through Mind—a limiting force constituting the individual Consciousness.

Science by "dematerialising" "matter" has made a long step towards the acceptance of Vedānta: for gross matter is reduced by some to Energy of and in some substance which is not gross Matter. Nevertheless it remains a quasi-material object. Vedānta says that both it and Mind are forms of the one Power or *Shakti* which existing in those two forms is, in itself, one with the Power-Holder who is the Supreme Consciousness or *Chit*. Consciousness then as Consciousness-Power or Energy is at the back of everything. Since this book was written the English Edition of Professor Lewis Rongier's "La Materialisation de l'Energie" has come to my hands. This is a lucid resumé of recent physical investigations in which the view is taken that Energy is a substance which materialises as the sensible Universe which does not on that account lose the reality of the substantial characteristics which external perception and common sense have attributed to it.

There are some who disparage and contemn Matter and regard it as something evil and sometimes as unreal. From the following pages it will appear clear that this is not the Shākta View. For, in the first place, what is it according to such views? It is the Gross (*Sthūla*) form of the Mother-Power which evolves the Universe. It is the form in which the Ultimate Reality is *touched* and handled. In the second place, is it real? The answer developed in my volume "Reality" is that it is real, for it is a form of *Daivī Shakti* or Supreme Power which is real, being one with the Ultimate Reality itself (*Kutastha Shiva*) who is the possessor of such power. But neither it, nor any other form (and Form implies finiteness) has the reality of the Ultimate Real—*Ens Realissimum*—for the latter endures changelessly in past, present and future, whereas Matter as such is in each universe developed from Power, and at the end of the Universe is absorbed in the Power from which it issued. Matter is real in the sense—that it is a reality independent of human appreciation, that is, it is not merely a creation of the human mind. Dematerialisation

means the reduction of gross, so-called ponderable Matter into points of stress. What has been called ponderable Matter on the other hand has been described to be a form of Energy enormously accumulated in a narrowly circumscribed region of space. Nor again does Matter become unreal because recent Science has dematerialised it. It is not "illusion". "Illusion" is a misleading rendering of the word '*Māyā*' by those who did not know sufficiently Sanskrit or English or were possibly—misled by other phrases, *e.g.*, '*Mriga-trishnā*' ('Mirage')—a term to be found in *Advaitavāda* relative to the reality of the Supreme Brahman as compared with the passing Universe. *Māyā* comes from the root *mā*=to measure. *Māyā* is not "illusion" but power by which things are measured. *Mīyate anena iti Māyā*, *i.e.*, the principle of form or *finitisation*. But finitisation is not illusion. What is experienced by all normal experiencers cannot be an illusion in the English sense of that term.[1] Then is it Evil? Essentially it cannot be so, for

[1] Illusion is prātibhāsika sattā. Let it be here noted that the Vedanta does not speak of even this illusion as a form of unreality but as a form of Sattā or being for it is real while it lasts.

it is a manifestation of *Daivī Shakti* which is Supreme Consciousness as Power. Nor even considered abstractedly as Matter, *i.e.*, apart from its combinations—is it so?

As regards such combinations, it must be noted that according to Hindu views the gross material universe is a duality (*Dvanda*) of good and evil, of happiness and sorrow and of all other opposites which are themselves each relative. They are never absolutely separated from one another. Thus nothing is entirely good nor bad. Some physical things and events and some living entities are injurious and others favourable to man, and to some men and not to others or may be not favourable to any man but to some other living creatures, and so on. We do not complain of the matter of our body when in health. But we may do so in disease. The same ship which makes shipwreck in a storm to the misery and death of its passengers has probably swiftly, safely and comfortably carried many others. Much evil is the cost price which we have to pay for what is good. Matter *per se* is neither good nor evil, but particular forms of it, or uses to which it is put, may be either

good or evil relatively to some subject. In such case, it is the Mind which gives the direction which spells goodness or evil. The Universe of Mind and Matter is neither good nor bad. A Hindu is neither a pessimist nor an optimist in the ordinary sense of these terms. He sees that the world is a world of opposites, that duality involves such opposites and those who desire freedom from such duality, its risks and pains, seek liberation. This liberation is not, according to the method of the School, an "escape" from Matter, but a knowledge of what Matter really is and a Yogic transformation of the Self whose gross Vesture it is. By *Sādhanā* and *Yoga*, Matter is recognised for what it really is, and thereafter there is, in consciousness, sublimation of Matter into its Essence.

I will in conclusion repeat what I have said elsewhere (Shakti and Shākta, 2nd Ed., 189).

"And yet as extremes meet, so having passed through our present condition we may regain the truths perceived by the simple, not only through formal worship but by that adoration which consists of the pursuit of all knowledge and science after the husk .of all

material thinking has been cast aside. By this adoration, intellectual approach is made to the Brahman. For him who sees the Mother-Power in all things, all scientific research is wonder and worship. The seeker looks then not upon mere mechanical movements of so-called "dead" matter but at the wondrous play of Her Whose form all Matter is. As She thus reveals Herself, She induces in him a passionate exaltation and the sense of security which is only gained as approach is made to the Central Heart of things. For as the Upanishad says "He only fears who sees duality". Some day, maybe, one who unites in himself the scientific ardour of the West and the all-embracing religious feeling of India will create another and a modern "*Chandī*" with its multiple salutations to the sovereign World-Mother. (*Namastasyai namo namah.*) Such an one seeing the changing marvels of Her World-play will exclaim with the Yoginīhridaya Tantra "I salute Her the *Samvid Kalā*[2] who shines in the form of Space and Time, words and their meanings, and in the form of all things which are in the Universe".

[2] That is the Supreme and Perfect Consciousness.

Deshakālapadārthātmā yad yad vastu yathā yathā,
Tattadrūpena yā bhāti tāng shraye samvidang kalām.

This is however not mere "Nature-worship" as it is generally understood in the West, (see observations at p. 7 of Dr. Helmuth Von Glasenapp's recent book "Der Hinduismus,") nor the worship of "Force" as the Bengali "reformer" of Hinduism, Keshub Chunder Sen wrongly took the Shākta doctrine to be. All things exist in the Supreme Consciousness which, in Itself, infinitely transcends all finite forms. It is the worship of God as the Mother-Power which manifests in the form of all things, which are, in the language of the Shākta Scripture, but an atom of dust on the Feet of Her who is Infinite Being (*Sat*), Experience (*Chit*), Bliss (*Ānanda*) :[3] and Power (*Shakti*).

This volume was commenced by me with the help of my friend Professor Pramathanātha Mukhyopādhyāya, but during its progress and at its conclusion, I found myself to be

[3] This Bliss is the Supreme Love of the Self for the Self. *Niratishaya-premāspadatvam ānandatvam.* She is worshipped in Madhura Bhāva.

so greatly indebted to him that it has become a joint work and is issued as such. I mention this to explain why some portions of the work are written in the singular as also to exempt him from responsibility for views (if there be any) which may not be his, and explanations of the subject which he might have bettered. In connection with the subject matter of this volume I may refer to his essay on the Radio-activity of Matter, as also to Prof. Lewis Rongier's work " La Materialisation de l'Energie " the English edition of which (" Philosophy and the New Physics ") only came to my hands after this work had been written. Prof. Rongier's general conclusion is—" abandoning the ether " (which is endowed with contradictory properties and which is declared defunct, without estate, a matter which has been here dealt with to some extent) " we are " (he says), " led to an entirely different theory, that of the materialization of Energy, emerging from the phantom realm of imponderables, to take substance, appearing as endowed with inertia, weight and structure and manifesting itself in two forms, one of which is called. by virtue of long prescription, Matter

and the other, Radiation." Here Energy (*Shakti*) is the principal concept.

The next volume of this series deals with the concepts of Causality and Continuity. It will be followed by another dealing with the highly important subject of Consciousness (*Chit*), and its Power (*Shakti*). Unless this term (*Chit*) is understood nothing in Vedānta or in its particular form—the Shākta Āgama—will be understood.

Bormes, Var
15th Feb., 1923

J. W.

THE WORLD AS POWER

POWER AS MATTER

§ 1

To begin with, we must distinguish between *Perceptual Matter* and *Conceptual* or *Scientific Matter*. Perceptual Matter is what possesses the sensible qualities of motion, impenetrability (that is limiting resistance or the limit where absolute resistance begins), weight, extension in space, colour, taste, smell and so forth. This is, for the psychologist, a certain group of sense-impressions objectified and localised in space. It implies a substratum of those sensible qualities (*i.e.*, a thing which supports sensible qualities and presents them to our senses), or an exciting cause of that group of sense-affections. Whether this implication of a substratum or thing as distinguished from (or as underlying) the sensible qualities or of an exciting cause as distinguished from

a group of sense-effects, be legitimate or not, we do commonly review in thought Perceptual Matter in the manner described above. That is, when we *think* of Matter which we have *perceived*, we think of it as a thing which underlies certain qualities corresponding to certain sense-impressions and as an exciting cause of these latter. This is commonly how the perception of Matter appears when it is passed in review. In itself, the actual perception of Matter or Matter as *presented* is alogical (*anirvachanīya*), admitting of no such logical categories or thought constructions as Subject and Object, Cause and Effect, Thing and Attribute and so on. But upon the *presentation* of Matter, thought construction [1] begins, the categories of the understanding (as Kant would call them) are set in operation, and out of this operation (mostly instinctive) the *presented* Matter emerges as *re-presented* Matter, *i.e.*, what we think, believe and describe as perceptual Matter. Thus we know presented Matter as a *substance* existing in *space*, *objectively* to us, moving in *time*, possessing certain *attributes* and *causing* certain impressions

[1] Antah-Karana-Vyāpāra.

in us. All the ideas involved are logical forms or moulds into which the presented matter is cast by us, and the Matter thus informed or moulded is taken by us as the Matter of Perception. It is clear, however, that *this* Perceptual Matter involves conceptual elements. Whether these conceptual elements or thought-forms are or are not subjective forms only—*i.e.*, whether or not there are realities beyond our thought corresponding to these forms (Time, Space, Substance, Cause, etc.) is a question which is not here discussed. Thus, so far, we get two stages in the experience of Matter:

(1) The original, intuitive, alogical experience of Matter apart from the incidence of the thought-forms: this is Matter as we actually feel or apprehend it.

(2) Then we have that original datum of experience as treated by the Subject with his thought-forms: this treatment giving us what we believe, think and describe as the Matter of our perception.

This latter is believed by the Indian systems to possess, both the so-called "primary" and

the "secondary" qualities.[2] The metaphysical reality of these is not here discussed, nor do we discuss whether the second or logical was already implicit in the first or alogical, so that the second is only the "lighting up" of the first.

After the second stage, the psychologist would put in "images" or mental rehearsals of the things perceived, *e.g.*, the mental reproduction of the smell, taste, colour, size, weight, etc., of an orange which has been actually handled and eaten. It is clear that in such images the primary as well as the secondary qualities of the originals perceived are copied, though with loss of vividness and the like. As these images are not relevant to our present purpose they are passed over.

But let us suppose that the so-called primary qualities (or some of them) alone are retained in ideation, and colour, taste, smell and sound are abstracted in thought. This would give us a sort of Conceptual Matter of which we have no perceptual equivalent. We now have,

[2] See discussion in the first volume of this series, "Reality".

for example, a Matter which occupies space, moves in space and time, possesses mass and weight, resists movement, and so on. But *in itself* it may be without colour, taste, smell, heat and cold, sound and so forth. These last result from its stresses upon our sense-organs. The effects wrought in us may be for aught we know wrongly (we are here simply stating the scientific position) fastened by us upon the exciting external cause.

Now, this Conceptual Matter is Scientific Matter. Whether such Matter exist or not, we have commonly no perception of it. The Ether, Atoms, Centres of Force, Lines of Force and the rest with which Physics attempts to write a description of the mechanism of the world sensed by us are not objects of perception. And yet they are said to underlie and cause all our sense-experiences, and thus are at the root of all our sense-phenomena.

Physicists, again, are not impartial to all the so-called primary qualities. Some, like Descartes, would regard extension as being the essence of Matter. As Professor Tait, (in his book "The Properties of Matter") did, so one might give as a working definition of

Matter: "Matter is whatever can occupy space." Others, following in the footsteps of Leibnitz, might put the essence of things in Dynamism, *i.e.*, power to exert, and resist the action of, force. This Dynamic view is steadily gaining ground in modern scientific thought—Shākta doctrine is also a pure and universal theory of Dynamism. Shakti is Power; all is Shakti. Matter is now that which *moves*, as indeed were *all* things to Heraclitus, the ancient Greek Philosopher ("All things flow") and to the Hindus to whom the world was *Jagat* or "the moving thing" or again as they are to one of the philosophers of our day, Prof. Henri Bergson.

A comparison of the notions held concerning Matter by Modern Western Science and the six orthodox Philosophies of India[3] must take account both of fundamental differences as well as similarities. The former are apt to be overlooked by those who estimate Indian Philosophy (whether such estimates be high or low) by its conformity or non-conformity with Western Science. At the outset therefore some of the main points which should be borne in mind—are noted.

[3] See my "Reality".

Ancient India had its Chemistry and Alchemy [4] and most important among these were the so-called Tantrik and Mercurial [5] Schools. But all this is part of Science [6] as it was then known. The six philosophies dealt with the subject matter from a philosophical and religious standpoint.[7] From the latter standpoint it is of the first importance to remember that the Indian notion of Matter is based upon a *psychological* analysis of the actual experience of Matter, the element thus obtained being substantialised, and not upon a *physico-chemical* analysis such as that of Western Science. Start is made with the actual perceptions of gross sensible Matter. The mind divides and subdivides until it arrives at the minimum psychosis which, objectively considered, may be called, to use an expressive

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[4] See Sir P. C. Ray's Indian Chemistry. Both Indian Chemistry and Medicine are indebted to the Tantras. It was these latter which added the metallic medicines to the vegetable drugs of the Āyurveda.

[5] Mercury is the semen of Shiva as Mica is the bīja or seed of Shakti. 'Ārtava' or menstrual flow is Red Sulphur. According to Hindu notions not women only menstruate, but the whole earth menstruates in its season.

[6] Vijnāna.

[7] Jn̄āna.

term of a recent English work, "Psychon" which in Indian terminology is a Paramānu or Tanmātra, the supreme power producing both the sensible and the senses and the sensations which the former stimulates in the latter.

As regards Matter, the first standard agrees with Western Science in so far as the latter makes it or treats it as an extra-mental reality. There are however, important points of disagreement between the two also. In the first place, Western Science draws a distinction between primary qualities and secondary qualities and regard the former set alone as really inherent in Matter and elements of Matter, whilst according to it, the secondary qualities are only effects produced upon a percipient subject by the primary set. No one of the three standards recognises any such partition. In these standards things are as things what they appear to be. The qualities, primary or secondary, are in the things themselves. This question has been discussed in an earlier Volume.[8] The Hindu orthodox systems are, therefore, in an *epistemological* sense realist,

[8] See "Reality".

under whatever class they may be said to come metaphysically.[9]

The second standard (Sangkhya-yoga) is metaphysically realist in so far as it affirms the reality of Mind and Matter in both gross and subtle form.[10] In the Monistic Vedanta both Mind and Matter are as such real but are forms of That which is neither.[11]

What then is Matter? It is of importance to note that former Western notions concerning Matter have been completely reversed in recent years. As we proceed backward in the later history of Western Science, we find less and less co-ordination between the Sciences and between the facts of any particular Science. The Universe presented the appearance of a heap of miscellaneous unconnected facts.

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[9] A reviewer of the latter book has thought that "its object was to defend all the Hindu systems against the charge of philosophical idealism". This of course is not so. I dealt with the theory of knowledge. Perhaps, however, a passage at p. 25 may have misled. I was there contrasting Hindu doctrine with Buddhist subjectivism and referring to the reality of Matter to the individual experiencer.

[10] Both are forms or vikritis of the one Prakriti.

[11] This ultimate Reality is mindless (amanah). We have therefore here no concern with systems which regard Matter as Mind.

Latterly, there has been an increasing tendency to the establishment of continuity and unity: and this is but natural, for the Scientific Mind working towards unity is, whether conscious of it or not, a step in the progress towards the realisation—"I am Brahman" (*Aham Brahmāsmi*). This unity of all things and the immanence of the Spirit in all things has ever been affirmed by India and represents one of the most valuable parts of its colossal philosophic and spiritual achievements. The general tendency is now towards some form of radical monism as a result of greater and greater co-ordination and unification of sciences and of science with Philosophy and of Philosophy with Religion. Summarising the main result of this scientific revolution, we may say that it consists firstly, in the teaching of the destructibility and *dematerialisation* of sensible matter existing in an *ethereal* medium; secondly, the *unification* of Matter and Energy in the sense that these are no longer considered different things but aspects of one and the same thing; and thirdly, in the acceptance of the doctrine which places the essence of matter in its *dynamism*. Matter in this latest view is not

something inert merely occupying space but essentially dynamic with mobility as its fundamental trait.

Each of these affirmations which are considered later in detail were made by ancient Indian doctrine. To it gross sensible Matter (*Bhūta*) issues in and from, and is again dissolved in, the Ether in the sense of *Ākāsha* and is in its ultimate sense not material at all. It is, to use the words of the Poet, "such stuff as dreams are made of". Matter (*Bhūta*) and Energy (*Karma*) are two aspects of the Ground Power (*Mahāshakti*). Matter is only a variety of Substance-Energy; what are called imponderable things or mere forms of energy being a subtle rapid mode of function whilst ponderable matter is a gross and slow mode of function of Universal Substance-Energy. The essence of things is dynamism which, in its causal sense, is the Supreme Power or Will (*Parā Ichchhā Shakti*) and, in the sense of effect, psychical (*Mānasa Shakti*), vital (*Prāna Shakti*) and physical (*Bhūta Shakti*) manifestations of such Will. What we know and are conscious of in ourselves as Will-Power is objectively observed as energy. We may measure energy

as it is manifested within the universal system : but the sum total of energy is not as in the doctrine of " Conservation of Energy " a limited constant. There are no absolute bounds to the magnitude of energy which is the manifestation of the Infinite Power of Becoming (Shakti) of Being itself (Shiva). This dematerialisation and dynamic view of matter and unification of matter and energy as aspects of one substance together with the recent revival, though with added proofs, of the old doctrine of Relativity makes the notion of *Māya* at least intelligible even to those who have hitherto derided it. But *Māya* covers both Mind and Matter. Some have regarded extension as being the essence of the latter. Mind its antithesis was said to be unextended. The allegation that Matter is extended and that mind is not, is only a metaphysical theory. When dealing with any metaphysical or scientific theory, it will be useful to remember that the Vedānta does not admit of any absolute partitions whatever. The realisation of its standpoint in this respect is one of the chief keys to an understanding of that system. The doctrine of the macrocosm (*Brihat Brahmānda*) and microcosm (*Kshudra Brahmānda*)

—expresses the same principle, so well-defined in the Vishvasāra Tantra in the words " what is here is elsewhere, what is not here is nowhere ". (*Yad ihāsti tad anyatra, yannehāsti na tat kvachit.*) In each centre everything is in some manner, be it explicit or implicit. Thus, it is said in the Mantra Shāstra that all the letters of the Alphabet are in each of them. Thus, mind and matter are both Fact sections (as they have been aptly called) of Experience as a whole (*Pūrna*).[12] Matter is said to be that which occupies space which space, considered as substance, is the Ether in which the material world is. Mind, considered as a centre of stress and strain, postulates also a continuum in which it also energises, *i.e.*, the Ultimate Plenum (Pūrna or Pleroma) which is Infinite Consciousness and unlimited Experience. Mind and matter are two aspects as subject and object of one and the same Whole (*Pūrna*) which is neither and yet includes both. Matter and mind are one in this that neither is, *as such*, Spirit since both are principles of unconsciousness. Mind can be said to be immaterial only

[12] By Prof. P. N. Mukyopadhāya in his " Approaches to Truth ".

in the sense that it has not the materiality of ponderable matter which is a gross and slow mode of energy-function. It is not, however, immaterial in the sense that Spirit as such is: that is absolutely so. Just as the recent experiments on Matter speak of emanations less and less material, semi-material, quasi-material and so forth between gross ponderable Matter on the one hand and the Ether which is not "Matter" on the other,[13] so we may say that since neither Mind nor Matter are as such Spirit, both are in essence "material," ponderable matter being wholly so and Mind being quasi-material in the sense of its being like Matter an unconscious principle or Force veiling Spirit or Consciousness (*Chit*) but not grossly material as ponderable Matter is. Ether in the Indian sense of *Akāsha* is derived from what may be called a "Psychon"[14] or an element of Psychosis as sense-experience regarded as objective. This Psychon again is a projection of certain fundamental psychic cosmic

[13] That there is substance intermediate between Matter and Ether is said to be shown by the variability of the mass ascertained.

[14] Or Tanmātra: to borrow a term of an English author whose name I forget.

principles[15] which are themselves rooted in the fundamental Power of Becoming which is the Cosmic Will (Mahāshakti).

§ 2

It will be useful here to shortly survey the immediate past and present notions of Matter held by Western Science, even though some conclusions are yet of an hypothetical character only. I refer to currently accepted and orthodox scientific teaching. For there have always been, as elsewhere, Alchemical and Mystical schools and lately systems of scientific monism which affirm unity in the form of a Fundamental Substance and its development into various modes of itself. As the great Giordano Bruno, who was burnt because of his doctrine, said in his treatise "Della Causa Principio Ed Uno"—"what in the principle is unseparated, single and one appears in externality in things, sundered, complex and multiplex".

Firstly, let us consider the *de-materialisation* of Matter. Formerly the material universe was regarded as made up of compounded

[15] Asmitā, Ahaṃkāra and Buddhi, see *post* and 'Reality'.

bodies, themselves constituted by the aggregation of simple bodies. These last were the so-called irreducible, chemical elements some eighty in number. The ultimate factors of compound bodies were the molecules or the smallest particles subsisting of those bodies which exhibited the properties of those bodies. The molecule again is a group of atoms. The atom was, according to Newton, a hard, geometrical, impenetrable,[16] solid body incapable of deformation. Though infinitesimally small and indivisible, it was yet regarded as spatial and as having some magnitude. Like gross sensible matter of which it was the ultimate factor, it was held to be extended and to have mass or amount, weight[17] and was characterised by Inertia. There were as many different kinds of atoms as there were different elementary substances. Each of these substances was regarded as a separate chemical

[16] This was believed to be true not because it was demonstrated but because it seemed reasonable, as it was on the assumption of hardness. Clerk Maxwell called it nevertheless "a vulgar opinion".

[17] The elements in the order of their atomic weights arranged from the lightest or Hydrogen to the heaviest Uranium.

species which, like species in living beings, were invariable. An absolute break was thought to exist in each case between the different species of so-called inorganic matter, between non-living and living matter, and between Matter, whether organic or inorganic, and Mind. Carrying disunity and discontinuity further Theology postulated the greatest break of all between the universe of Mind and Matter and its ground as God.

The Hindus have, for at least some two thousand years, postulated a continuum in which discrete material things exist, *viz.*, a subtile substance and plenum called *Akāsha*. This as Ether was put forward in the 17th century by the Scientist Huygens in order to explain the Phenomena of light. Some now accept it and some do not. Those who do so have regarded it commonly as a third thing distinct from Matter and the supposed Forces which animate the latter, though Energy exists both in Ether and in Matter which lies immersed in Ether and cannot be isolated from it. There were thus three separate indestructible and constant things, *viz.*, Matter itself, Ether itself and Energy in Matter and Ether. The

duality of Matter and Energy, the indestructibility of the former and the conservation of the latter were generally accepted doctrines.

It was then however observed that, as in living beings, there were both genus and species. Certain forms possessed a family likeness and therefore possessed similar properties. They can be divided into their respective families by their atomic weights. And so by what is called the Periodic Law of Mendeleef and Meyer the properties of an atom may be known from its weight. This law was established before the dissection of the Atom. Since then it has been suggested that the atomic weight of an element is proportional to the number and form of arrangement of the electrons or units of electric charge, of which the atom has since been conceived to consist. The arrangements according to the Periodic Law almost suggested, it has been said, a genealogical tree. Predictions of the properties of new elements which would fill up the missing links in the scale were subsequently verified by actual discovery. Earlier Chemistry noted the existence of bodies of seemingly identical nature, though differing in properties, called Allotropic. These allotropic

states may be classed as different species of the same genus. The same metal presented itself in forms which could not be confused. On the other hand nearly a quarter of the simple bodies known are so similar, that without special investigation they could not have been isolated. Further investigation with instruments of greater precision showed (it was said) that between chemical as between living species there were transitional forms. There is a genus with several species, and there are some species so alike that chemical action could scarce distinguish them. Colloidal metals may even resemble in some ways organic substance. All this pointed to the same variability of chemical species as biologists affirmed as regards living beings. When it was discovered that the atom was not invariable or indestructible, it was affirmed that simple bodies may be transformed even more easily on account of their greater simplicity than animal species. If .Matter, as it is now held to be, is no longer indestructible and fixed, then the invariability of chemical species no more exists than of living species. We thus return to the transmutation of substances of the old and derided alchemists.

Spectrum analysis showed that the materials of the universe were throughout the same whether on earth or in the remotest stars. It was also by the same means observed, that the hottest stars are constituted of very much fewer chemical elements than the colder ones—a fact which suggested that the elements in the latter were evolutionary transformations of the former. These observations alone, however suggestive, were insufficient to prove the actual transformation of chemical elements into others with different characteristics which they possessed at certain relatively fixed states for so lengthy a period as to almost disprove evolution as the continuity of change in the elements. Then Sir William Crookes discovered the Cathode Rays. He called it a fourth state of matter and named it Radiant Matter, now considered by some to be electricity. To the three conditions of matter solid, liquid, and gaseous in which there is decreasing cohesion in the molecules was added a fourth state which was said to be as far removed from a gas as gas is from a liquid. Later on, the particles were called Corpuscles or Electrons or units of Electric

charge. The latter made up the atom which was then regarded as a cluster of electrons varying in number and arrangement but identical amongst themselves, building up by such number and arrangement the different kinds of matter—the "elements" known to the chemist. Professor Crookes was then led to put forth the ancient idea (to which man has returned again and again) of a Primitive Stuff called Protyle from which all the elements were derived. The Phenomenon of the dissociation of matter was then more fully investigated. Certain stages in the process of the dematerialization were noted. Radio-activity was established as regards all forms of matter, though most manifest in some radio-active substances such as the heavy Radium, Thorium, and Uranium. The first emission was a non-electrified product called by Professor Rutherford the "emanation," which to him was material gas and has also been said to be (le Bon)[18] semi-material. From it are produced the Alpha, Beta and Gamma rays. The Alpha rays are the positive Ions of which the electron or atom or unit of negative

[18] L'Évolution de la Matiére. See also the same author's "L'Évolution des Forces".

electricity is the Nucleus. The Beta Rays are rediations of electrons formed of negative electric atoms which are identical with those of the Cathode Rays; and the Gamma rays are said to be analogous to the Rontgen or X rays the nature of which are not known but which are neither Cathode, nor ether waves in the nature of light but which are (it has been suggested) pulses of electric and magnetic force manifested in the breaking up of the electron itself. These Rays are said to be less and less materialistic, the first being invisible atoms of matter or an intermediary having properties in common with a material body: the second being pure electricity freed of matter and the third as above described. As regards the unit of positive electricity there is more ignorance, but the opinion has been expressed that it also is freed of " matter ". That there is substance intermediate between matter and ether is said to be shown by the variability of mass ascertained. One property of matter remains invariable namely the mass measured by the weight. But variability of mass or " mass-acceleration " is ascertained as regards particles emitted by radio-active bodies. The mass varies with the speed

showing (it is said) that substances exhibiting such a property are no longer "matter," the mass of which is fixed and invariable. The Atom of matter has been described to be no longer an indestructible mass, but is a sort of solar system formed by a central group of nucleus charged with positive electricity around which negative electrons gravitate in closed orbits. The electrons are the same from whatever source they are obtained. Thus, it has been said, we find that the infinitely small which had been thought to be final has itself grown into a world. And naturally so, for each form of existence is a microcosm (*Kshudra-brahmānda*) as the Shāstra teaches and the Brahman is both greater than the great and more minute than the little. (*Mahato Mahīyān Anoraniyān.*)

To sum up, Matter has been defined as that which possesses inertia, weight and mass. As so defined, matter is what is ponderable, but inertia in the ordinary sense is now denied. No matter is at rest since all is in continual movement (*Spanda*). On the contrary the atom is now said to be a reservoir of stupendous energy. Everything must be that if it be a form of infinite Power.

The notion of inertia we get from superficial observation of molar masses. There is no rest anywhere beyond (in some conditions and for a time) an apparent absence of relative change of conditions between one particular molar mass and another. Even here each molar mass itself is disintegrating and its atoms are in continuous movement and dissociation. There is continuous molecular birth and death.[19] Whether again Matter has weight depends on certain conditions. It would cease to have weight if taken to the centre of the earth or placed at a suitable distance between the sun and moon. The attraction of the earth depends upon where it is. Would it, if so placed, cease to be matter? A measure was therefore sought independent of position namely division of the weight of the body at a given place by the value of gravity at that place, the quotient being called the "Mass". Moreover matter is said to dissociate into the imponderable Ether which cannot be weighed. In other words

[19] Both Brahmā and Rudra are continuously at work. It is error to suppose that Brahmā created some years ago and is now doing nothing. See chapter on "Om" in my "Garland of Letters".

matter is ultimately something not weighable. It can be weighed only so long as it remains in that state in which it can be weighed. Mass again is the measure of inertia, that is to say of the property which enables matter to resist motion or changes of motion. In the case of ponderable matter this mass is not permanent. Variability of mass that is of inertia has been noted in the particles emitted by Radio-active bodies during disaggregation. The mass varies with their speed and this variation is relied on to show that substances which exhibit such a property are no longer "matter". The particles produced during the dissociation of matter possess a property resembling inertia, and in this are akin to matter, but this inertia instead of being constant in magnitude varies with the speed, and on this point the particular particles, though issuing from matter, are differentiated from its atoms. It has also been supposed that the corpuscle or electron which is said to be the ultimate element of matter is quite free from it. Moreover Ether into which matter is said (in disaggregation) to ultimately lapse, is, according to some theories, without mass, therefore Matter in its ultimate basis

is without it. In other words the first law of motion which may also be expressed by saying that all matter has inertia or inability to move, or to change velocity or direction if it already has motion, only appears to be experimentally true of bodies whose magnitude and state we can ordinarily see. The notion is due to superficial observation of change of position of gross bodies. But further knowledge of the constitution of Matter itself has shown that the ordinary notion of the inertness of matter is not true. For Energy, called sub-atomic, is now found to be locked up in the atoms and if they have energy they must have motion of some sort, and are shown to be in motion even when the molar mass of which they are the atoms appears to be in rest. In the same way it has been said that potential energy must in some way depend on motion. A French author (L. Houllevigue) after describing this process of dematerialisation asks "Are these things certain? One must beware of believing it. Tomorrow perhaps the wind of a new theory may sweep away all these hypotheses. We are upon scientific ground of too recent a date, for it to be possible to build

solid structures." Since this was written, subsequent investigation has confirmed in considerable part what had previously been affirmed. It is however a fact that some parts of the theories set forth are regarded from a scientific standpoint as doubtful or as semi-certitudes or mere hypotheses. In some matters the "wind of theory" to which the author refers has veered towards older and rejected doctrines such as regards light the corpuscular doctrine of Newton, and as regards electricity that, whatever it be, "it is a thing and not a mere form of energy". In other points the movement is towards a new outlook. Thus there is a school of chemists such as that of Franz Wald and Oswald who would give account of chemical processes not in the language and according to the ideas of the atomic theory, but in terms of Energetics, according to which matter is but a Centre of Force or a Complex of Energies found together at the same place. The former view is more akin to the Nyāya-Vaisheshika system with its lasting "atomic" Paramānus deriving ultimately their motion from a First Mover and the latter to the Vedānta doctrine of Shakti which as immanent Power

in and as all things is the source of their auto-dynamism.

But can the Mind stop at the electron? It cannot rest until it has become the whole[20] beyond which there can be nothing as it is all. Electricity itself is now believed by some to be granular or atomic in structure. The electric condition is regarded as a condition of stress in Ether which is not in any sense Matter according to its scientific meaning and is that which is the subject of stress and stain. The Electrons are points or centres of energy in the ethereal continuum constituted by stress and and strain centres not only in, but also composed of, the ethereal substance—vortices of and in the ether as it has been suggested. Regarded as such, they might be considered as the infinitely small:[21] but the stress when considered as an attitude of the universal system taken as a whole is infinitely great.[22] The infinitely little from one aspect is from another the infinitely great. Everything which lies

[20] Pūrna.

[21] Anu.

[22] Mahat.

between these two limits exists in varying grades of magnitude.[23] But the ideal limit or perfection of the continuum[24] is not Scientific Ether but is in Vedānta the Chidākāsha or Ether of Consciousness, of which as Power, in the form of efficient and material cause[25] all the psychical and physical universe is composed and in which its movements take place. Science however is not concerned with Matter other than as an objective extra-mental Reality. Vedānta resolves both it and Mind into forms of expression of the Supreme Cosmic Will containing latent tendencies (*Sangskāra*) towards manifestation as centres of limited will and experience.

What, then, is Energy? This is defined as 'capacity' for work. The ability which one body has to move another is sometimes called its energy. The energy which a body has, depends on its own amount of motion. Motion, again, is

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[23] The supreme exemplar of these two limits is the all-pervading Chidākāsha and the Point of Power or Bindu Shakti which the Shāstra describes as ghanībhūtā shakti that is condensed concentrated Power about to manifest.

[24] Mahat.

[25] Chit-shakti and Māyā-shakti.

of two kinds—*viz.*, motion in a body of its constituent elements, motion which makes it what it is. Then there is motion of the body as a whole from one place to another, that is, locomotive movement. This last may be communicated from without by another body in movement or may be self-initiated. The inner movements and self-initiated locomotion of living bodies is well-known. But molar masses of inorganic matter were observed to be at rest. They did not move unless something moved them, *i.e.*, motion was communicated to them from without by means of other bodies themselves in motion. It was assumed then that the ultimate constituent of Matter, the atom, was also at rest and incapable by itself of quitting the state of repose. The interior constitution of the Matter as a system of moving units was unsuspected. Inorganic Matter was then held to be inert—dead or brute Matter as it was called. Of itself it could not move.

Inertia was a property which enabled it to resist motion or change of motion. This had to be overcome by the application of energy in action or force. Matter might possess energy but for this it must have motion and this

motion must be communicated to it from without through the motion of other moving bodies which had thus either received and passed on these movements or, in the case of living bodies, had generated them. All this was true enough as applied to molar masses of inorganic matter without power of self-initiative locomotive movement. But it ignored intra-atomic movement, the self-generated perpetual movement of the particles constituting the atomic system. There were thus two different things, however linked together, namely Energy in work or force and the inert Matter which it moved. Language was sometimes used in which energy was spoken of as if it were an entity or something which might exist though there was no substance to move. This, of course, is not so; for the two, namely, Matter and Energy are never dissociated. By the forms of our thinking we cannot conceive of one without the other. We think of matter which moves and is moved. In a transcendental sense, substance in its ultimate meaning is that which is common to all which is and which acts. It has two modes, namely, the rapid mode of function which

manifests as the imponderable energies called light, electricity, magnetism and the slow mode of function which manifests as ponderable matter. Matter the ponderable is a gross and relatively stable form of it. Heat, light, electricity and other imponderables represent subtile unstable forms of it. Both are forms of substance-energy in perpetual motion and manifesting such motion in organic matter as in all else. Matter is not, as formerly thought, incapable of possessing any energy but that transmitted to it and is on the other hand now held to be not inert but a reservoir of colossal intra-atomic energy or *Shakti*, and this must be so to the Shākta who believes that the minutest particle of inorganic matter is a limited form of the Mother-power, the potentialities of which are unlimited. All is in motion and though matter as a self may and does resist, yet mobility (Spanda) is its fundamental trait.

It has been said : [26]

"It would no doubt be possible for a higher intelligence to conceive Energy without

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[26] Le Bon L'évolution de la Matière 17.

substance for there is nothing to prove that necessarily it requires a support but such a conception cannot be attained by us. The essence of energy being unknown we are compelled to materialise it."

Both Substance and Energy however are necessary concepts of dualistic thinking. It is not possible to resolve either, as we understand them, into the other. It is only when they are transcended that their unity is found to be grounded in the Supreme Will as both efficient and material cause. It appears both as energy and matter, *i.e.*, energy inseparably associated with matter and matter inseparably associated with energy. Similarly in the same way mind is inseparably coupled with matter and matter with mind, their unity being found in the Power of Consciousness which is neither and which transcends both.

Energy has been divided into many forms such as kinetic, potential, chemical, magnetic and so forth. It was first thought that all the various forms of energy were subdivisions of the first two and then that all energy was kinetic, even potential energy being in some way dependent on motion. What have been

called "Forces" are various forms of motion of matter, or of the Ether each embodying energy. The ability which one body has to move another is sometimes called its energy, the energy which a body has depending on its own amount of motion. One form of physical motion or energy may be transformed into another, all being correlated. None of the forms is necessarily prior to any other. The various forms of Energy have been described as a closed ring of inter-relations within which motions are being exchanged by contact and and radiation. If energy is conserved, so also is motion and matter, all three being constant. Physics which formerly counted several energies which it distinguished from each other welded them all into one great concept "Energy" of many forms and of which constancy was predicated.

Professor Emile Picard says[27] that for one school of scientists, Energy is not merely an abstract conception without objective reality, but it has objective reality as much as and perhaps more than Matter and cannot be

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[27] "La Science Moderne et son état actuel," 136, 137.

created or destroyed. Whether from the equivalence of different forms of energy one can draw the conclusion of their identity is for the experimenter a question which will be answered by each according to his different theoretic views.[28]

The result of recent investigation is summed up in the following words by a writer in the "Times" reviewing recent theories of the nature of Matter :

"A monistic interpretation of matter has displaced the older view. And what are electrons, these new symbols of the physical conception of the material universe ? They are spoken of as positive and negative, the one with a mass two thousand times that of the other and with a two thousandth part of its

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[28] "Pour toute une école de savants, l'énergie n' ést pas seulement une conception abstracte sans existence réelle ; elle a pour eux, comme la matière, plus peut être que la matière, uno existence objective et. nous ne pouvons ni la créer ni la détruire. De. l'équivalence des différentes formes de l'énergie peut on conclure à leur identité. La question pour l'experimentateur, n'a pas de sens. . . . Et chacun peut y répondre diversement suivant ses vues théoriques." According to the Shākta standpoint there are phenomenally various kinds of Energy which are forms of the Divine Power (Daivī Shakti) as the one Supreme Will.

diameter. They are mathematical abstractions, their properties inferences from mathematical reasoning. In the last resort, matter has become a number, a measure, not a thing. *The metaphysician expelled from the physics of the last century has come back to his own.*"

In the result Matter in its ultimate form ceases to be the gross thing which it was formerly thought to be, and is not in such form, "Matter" in its ponderable sense at all. On the contrary, it is at base a subtile thing yet with some, however minute, degree of magnitude. This is not however to say that because Matter is subtile it is any the less real.

Indian Scripture carries the matter still further backwards. The First Standard to which Matter is also an objective extra-mental reality reduces however sensible Matter to Elements (*Paramānus*) which have no magnitude whatever.[29] In the Second and Third Standards both Matter and Mind are modes of one and the same Principle, Cause of

[29] They have neither length, breadth or height. The smallest particle of tri-dimensional, and therefore theoretically perceptible, Matter being a Trasarenu *v post.* The "magnitude" of a Parimānu is Pārimāndalya or a mathematical point.

the Psycho-physical (Prakriti, Māyā). From the Vedāntic standpoint they are modes of the Supreme Power (*Mahāshakti*) which, while it is in Itself pure unlimited Consciousness, is for the limited centre the fundamental Substance-Energy from which the limitations of Mind and Matter are derived. Matter then is the manifestation of the Power of the Supreme Will to appear as an *object* to a limited experiencing subject or Mind. But Matter does not appear all at once in the form of gross, particular, sensible Matter. It appears first as the Generals of the sense particulars, that is as the world of the Universals and then, with the development of the gross physical senses, Matter is experienced as the gross sensible particulars.

Both the world of the Universals and Particulars[30] have their origin in a common Psycho-Dynamic Principle which is itself a product of the Cosmic Will.

§ 3

Before recurring again to the Matter of Western Science I will make a short resume of

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[30] See as to these "Mind".

Indian Doctrine according to the three standards. For those who would understand Vedānta must also know both Sāngkhya-Yoga and Nyāya-Vaisheshika. What is here described as Shākta doctrine is a form of the Monistic (Advaita) Vedānta of the Third Standard.

To Western Science, Matter is an extra-mental objective reality in the sense of that which exists in its own right independent of mind: that is experience or no experience it exists. This is akin to the view taken by the First Standard (Nyāya-Vaisheshika) though according to the latter the ultimate elements of matter (Paramānu) which have been called "atoms" have no magnitude whatever.[31]

The "element"[32] of matter (the Tanmātra)[33] of the second and third standards[34] is not an objective reality in the same absolute sense in

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[31] And therefore differ from the atom or electron of science which have some magnitude however minute.

[32] In inverted commas because the Tanmātra is not a simple ultimate but a derivative from higher psychic principles.

[33] Lit. "thatness only"; they are generals of the sense particulars or universals of which the Types (ākriti) are constituted.

[34] Sāngkhya-Yoga and Vedānta.

which the true elements (the Paramānus)[35] of the first standard are believed to be. Taking objective reality, in its fullest sense, to mean that which is independent of experience, "experience" may mean either finite individual experience, whether conscious or unconscious,[36] or Cosmic Experience namely that of the Infinite Individuality (Parāhantā). The *Paramānus*, as external, are independent of both. On the other hand the *Tanmātra* according to Sāngkhya-Yoga is derived from mental functioning (*Buddhivyāpāra*) which need not be reflected on individual consciousness in all cases and is therefore independent of experience in that sense, for if it is not reflected in any particular consciousness, there is no *Tanmātra* produced for it. In Vedānta the *Tanmātra* is not independent of the Lord's experience, nor is it independent of mental functioning (*Buddhivyāpāra*) in the sense of the cosmic process of

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[35] Lit. "supremely little"; the constituent minima of sensible matter.

[36] That is conscious functioning of the mind (Buddhivyāpāra) or Buddhivyāpāra reflected in consciousness or Chit; or unconscious or sub-conscious Buddhivyāpāra that is functioning of mind (Buddhi) not reflected in Consciousness or Chit.

Māyā. It may, however, be independent of individual experience both conscious and subconscious.

Metaphysical Realism can therefore be predicated of the First Standard in which matter as such, though in its subtle form, is eternal. The second has been called both a form of Materialism,[37] of Idealism,[38] and of Psycho-dynamism[39]; and the Vedānta a system of Idealism, though it is not exactly Idealism in any Western sense of the word. Western labels are apt to mislead. It is better therefore to use the Sanskrit descriptions which are correct, namely the doctrine of an absolute new creation out of discrete pre-existing ingredients[40]

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[37] Garbe 'Sankh.' Phil. 242 *et seq.*

[38] Max Muller "Six Systems" X. It is neither "Materialism" nor "Idealism" for both Mind and Matter are phenomenally distinct and have their ultimate basis in Prakriti which is neither, but the source of both.

[39] J. C. Chatterjee "Hindu Realism," 14; inasmuch as the principles which it regards as the origin of the things are both psychical, *i.e.*, of the nature of feelings, thoughts, ideas; and dynamic that is of the nature of forces or powers. But here too a caution is necessary in that the psychical is the association of the natural psychic and physical principles with Consciousness which is not psychic in the sense of mental at all.

[40] Ārambha-vāda or Asat-kārya-vāda that is the non-existence of the produced before actual production.

in this case the minima of matter; the doctrine of the existence of the product in a potential form prior to its actual manifestation,[41] and the doctrine of the reality (in its truest sense)[42] of only the Originating Source of things, a doctrine in which the originating reality remains what it is but yet brings about and appears through its power as the result. In the first standard, matter in its gross sensible form is transient and its subtle constituent minima are eternal. There is no inherent dynamism. In the second and third both gross sensible and subtle matter are transient and dynamic, but in the second matter is eternal only in the sense that in the dissolution of the universe it is in potential form as the Fundamental Substance from which it really evolves. In the third standard from a pragmatic standpoint it potentially is as a Tendency in Being to which manifestation is given by the Divine Will; whilst from the transcendental standpoint, there is no actual manifestation at all but the changeless Consciousness

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[41] The evolutionist standard (Parināma-vāda) or Sat-kārya-vāda, *i.e.*, existence of product in potential form prior to actual manifestation.

[42] That is as changeless.

or Spirit alone. Thus even when matter as such as a mode of substance disappears it has the eternality and reality of its Cause.[43] All appearance as a form, action as such form, disappearance into some other form, is according to Shākta views due to the inherent dynamism of matter attributable to it because of its being an expression, though of a gross kind, of the Supreme Power (Mahāshakti) which is both the material and efficient cause of all.

The dynamic view of Matter which makes mobility the fundamental trait of Matter, would seek to deduce all the other "primary" properties of Matter out of this fundamental one. Matter occupies a certain volume of space, and resists movement in and through this volume; not because it is "inert" but because its essence lies in its power of self-conservation. An outside object is pressing against it; why does it resist? Why does it not absolutely yield? Because it exerts forces counteracting or seeking to counteract the action of the forces exerted by the pressing object. Only force can oppose force. A push or stroke is given

[43] Vivartta-vāda or Sat-Kārana-vāda.

to a thing; it resists; does not quite yield; and even returns the push which is felt as muscular reaction and possibly pain. According to Newton's Third Law of Motion, the force with which the thing has reacted is equal and opposite to that with which the push or stroke acted. The lump of Matter which is the thing, is therefore really capable of exerting and resisting force. It occupies a certain volume of space precisely because it can maintain itself in its own sphere. Without such power, it would have no sphere, no *locus*, and no existence at all. All individual things must possess such power to conserve themselves as they are, even though it be for a moment. To be an individual I must be able to hold my own, not only philosophically but practically in the life of the world. So life; so also Matter. A piece of iron is an individual object and self because it is able by its cohesive forces to hold together its molecules against the action of heat and so forth; a molecule is so because it is able by its cohesive forces to hold together the constituent atoms; an atom is so because it is able by its cohesive forces to hold together the electrons or "electric charges" which are supposed to be in

it, revolving in their orbits; and so on; for, even the electron cannot be, the absolute unit of Matter. It is clear therefore that every form of Matter has its boundary (*i.e.*, extension) determined by its own stresses acting against the stresses of the enveloping Order. Its essence is Stress or Power (Shakti). The Stress operates in and is a condition of, Ether—says Western Science; it operates in and is a condition ultimately of, Chit or Ether of Consciousness—says the Vedānta. Philosophers in the West too (as Herbart) have recognised that the essence of Thinghood is in the power of self-conservation; and idealists such as Hegel, Green and others have seen in it the power of self-realisation. Indian Thought (Shruti) says that the 'thing' is Brahman and is realizing itself as such, by its energising (*Karma*), through enjoyment (*Bhoga*) and ultimately through liberation (*Apavarga*) from the veil of ignorance or (*Avidyā*). This "ignorance," so much misunderstood, is knowledge. Knowledge of what? Knowledge of the world as mundane experience. And hence the Shaiva Scriptures say "*Jnānam Bandhah*" that is knowledge is binding. But what is

knowledge in this sense is ignorance (*Avidyā*) in another; for it is just this knowledge as a state of experience which is ignorance of pure spiritual experience as it is in itself. Power which, as mind and matter, cuts the full experience into sections gives sectional experience which necessarily shuts out full experience.

The very fact that Matter occupies space shows therefore that it is a system of stresses. The *form* of a material substance, again, is a *function of its motion*, *i.e.*, varies as this latter varies. A thing which is spherical when at rest will become an oblate spheroid when it moves in a certain manner. H. A. Lorentz has shown that an electro-magnetically constituted body which has a permanent configuration when at rest, when set in motion with a certain velocity, will contract in the direction of the velocity to a certain fraction [44] of its original dimension; distances at right angles to the direction of the velocity remaining unaltered. Now, since according to modern ideas, all Matter is electro-magnetically constituted (*i.e.*, made up of electrons or moving

[44] ($\sqrt{1-v^2/c^2}$ where v is the velocity of the moving body, and c a constant, *viz.*, the velocity of light.)

unit charges of electricity), the above result applies to all material things. We cannot therefore have a rigid body the spatial extension of which is permanent and independent of its velocity. A measuring rod, for example, will shorten in the direction of its length in a given ratio when it moves in a given manner. Spatial dimensions are thus the functions of, and relative to, the motions of things. Temporal dimensions or time-measurements also depend on and are relative to, the motions of bodies. This is the modern (though in fundamentals very ancient) theory of Relativity at which Dr. Einstein and others are still working. Space and Time relations are thus determined by the mutual stresses of things. What a thing apparently is, is determined by how it moves or by how it stresses. According to Hindu notions, the stress, or constituent forces of a thing as heard by the Absolute Ear is its Natural name, *Shabda* or *Bīja Mantra* which evolves and sustains its form.[45]

Not Form alone is the function of Motion (*i.e.*, varies as this latter does). Mass also

[45] See my "Garland of Letters".

is so. In Newtonian physics Mass was regarded as a physical constant. Howsoever Matter may move, its Mass was believed to be independent of its motion. A thing is at rest; it is moving with a moderate velocity; it is moving with a prodigious velocity: in every case, its Mass was believed to remain constant. But the electro-magnetic constitution of Matter does not warrant this belief. In the Electron Theory the property of Mass is explained as an effect of electricity in motion. Suppose an electric charge (*i.e.*, electron) is moving; that charge has its lines of force; so that when the charge moves, it carries its lines of force with it. Ether through which these lines of force are carried is dragged forwards by them (as explained by Sir J. J. Thomson); hence the momentum of the charge (*i.e.*, product of Mass and Velocity) is due to the inertia of the ether. It possesses a given momentum because it drags forwards ether by its moving lines of force. A moving charge has therefore something analogous to mass in virtue of its motion. The scientists Thomsom, Heaviside, Searle and others have calculated how much mass is due to how much motion. Kaufmann has also given

definite experimental evidence that the ratio of the charge to the mass for the corpuscles projected from radium decreases as velocity increases. That is, the fraction e/m (ratio of charge to mass) decreases as velocity increases. But since the charge (*i.e.*, the numerator of the fraction) is constant, the mass (*i.e.*, the denominator of the fraction) must increase in order that the fraction itself may decrease *pari passu* with the increase of velocity. Hence it follows that the Mass of the charge is a function of its velocity, *i.e.*, varies as this latter varies. It is true that for a slow-moving corpuscle, the Mass of the electric charge remains unaffected by its velocity; but when its velocity becomes comparable to that of light (nearly two hundred thousand miles per second), the electric Mass increases very rapidly. Nor must we imagine that such high velocities are exceptional in the case of the moving charges. The ejected corpuscles from radium move with velocities comparable to that of light; in the "atom" itself where the unit charges or electrons are "bound" instead of being "free," they have orbital motions compared with whose velocities, those of the planets in their orbits round

the sun would seem to be far too small. In the Rigveda the *Devatā Vāyu* or *Marud-gana* has for his chariot-animals packs of spotted deer which stands as the symbol of fleetness; and *Vāyu* in the Veda is, in his physical aspect, a subtle universal fluid in movement [46] of which gross "air" [47] is a coarser derivative. In the Anāhata Chakra, too in the Tantras, where the *Vāyu-tattva* is located, the *Yantra* (or graphic representation) includes the symbol of a deer. However that be, the electric charges or electrons which, in various configurations, are now believed to constitute all Matter, are not slow of foot: their high velocities are not exceptional. And we have seen that their Masses are the functions of their velocities.

And physicists now generally believe that the *whole* of the Mass of Matter is electro-magnetic Mass. That is to say, Matter does not possess a mechanical mass ultimately different in kind from its electro-magnetic Mass. The scientists Abraham, Thomson and others have calculated on the assumption that an

[46] From *vā*=to move.

[47] Panchīkrita Marut.

electron is *nothing but* a spherical charge of electricity, and their calculations tally with experimental results so far obtained. Matter now is thus not something which merely carries an electric charge or charges with it, but it *is* electric charges (positive and negative) somehow configurated together. The greater bulk of the Mass of atom is, according to some views, concentrated at the nucleus which is represented by the positive charge, and the swarm of negative charges moving round the nucleus have also their small masses; and the total mass of the atom is only the aggregate of the masses of its constituents which are positive and negative charges. This is the Electron Theory [48].

We have therefore a Syllogism. The Mass of a moving charge is a function of its velocity; the Mass of Matter is wholly the masses of the charges by which it is constituted; therefore, the mass of Matter is also a function of velocity (velocities of its constituent parts). Mass of a thing is thus dependent on its stress-system on

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[48] See Sir J. J. Thomson's "Matter and Electricity," or any other similar work.

what may be called in Sanskrit *shakti-kuta* or *shakti-vyuha*.

Because the mass of a body is a function of its underlying stress (Shakti), or what is the same thing, of the motions of its ultimate units, it follows that by changing or otherwise controlling those motions it is possible to change or otherwise control its Mass. Gold and Iron have different masses, because in each the stress-system is different. Or because in each the ultimate units (the electrons, to wit) are configurated and are moving differently. If we can equate these motions, gold and iron will be equated as regards Mass. Alchemy thus becomes possible by what the modern Chemist would call the change of "Atomic Number". Mass can be reduced or increased by controlling the domestic economy of the motions of the corpuscles. Many *Siddhis* or Powers will follow from such ability to control them.

The Bindu (or Metaphysical Point of which so much is said in the Mantra Shāstra)[49] as the concentrated or *ghanibhūta* condition of Shakti is an important stage in the creative evolution

[49] See "Garland of Letters".

of the world according to the Shākta Vedānta view. Mass (Tamas-Guna) follows as a consequence of such concentration of Shakti or Power. I revert to this when further discussing the Ether and its stresses.

We have seen that extension (together with Form) and Mass are Energy-functions (*Shakti Vyāpāra*) according to the teachings of Modern Science as they are in Shākta-Vedānta. Other properties are also traceable to the same *activity* which is at the basis of Matter. Take for example, resistance and rigidity of form. A substance which is non-resisting and without any shape, (*i.e.*, "a perfect fluid") may in virtue of rotational movement, come to offer resistance and present a definite shape. Rings of smoke illustrate this. A top at rest can hardly be balanced on the palm of the hand; if it be, its condition is most unstable; the slightest touch will upset it. But if an attempt is made to balance a top while spinning rapidly, on the palm of the hand, that can be easily done; the rotation of the top will counteract the effects of gravity—it will now stand on its point. If the spinning top is slightly pushed it will become disturbed and will oscillate about its

position of equilibrium to which it will speedily return after a few oscillations. The rotating top resists (as is felt when attempt is made to stop or disturb it) any movement which seeks to disturb it. Thus it shows resistance and rigidity of form *on account* of its rotational motion. If we take a perfect (*i.e.*, frictionless) fluid such as Ether and somehow [50] set up a vortex movement in it, it will possess, in that eddying portion, permanence, resistance and rigidity of form—all on account of the curling motion. This was the basis of the theory of Helmholtz and Lord Kelvin, that atoms of matter may be vortex-rings in Ether. This we shall see later. We find now that the "primary" qualities of resistance, rigidity and so forth are also Energy-functions or effects of movement.

Gravitation, or the mutual attraction of Masses of Matter has proved a stumbling-block to many otherwise successful theories. The effects of all other forces (such as heat, light, electricity, magnetism) are propagated through

[50] It requires what is called a super-natural agency to set up a vortex in a *perfect* fluid.

space in finite time; *i.e.*, they have their finite rates of velocity. If, for example, a distant star be now extinguished or rekindled, we should be aware of that phenomenon through light or loss of light, many years hence. Light takes so much time to travel from there. But suppose the lump of Matter which we call that star be now annihilated or a new lump be now created; then, this fact will instantaneously affect the gravitational system throughout the whole universe of matter. That is, its effect will be instantaneously felt (or produced) here. This *prima facie* makes the case of gravitation a difficult one. Nevertheless phycisists have worked at it; and attempts have been made to explain gravitation as a resultant of the attractions (*Rāga*) and repulsions (*Dvesha*) of the positive and negative charges which are believed to constitute Matter in conglomeration; in terms of pressures and pulls exerted through the ether; and as (by Le Sage) a result of the battering of "ultra-mundane corpuscles" on the atoms of matter.

So all the "primary" qualities may be reduced to and expressed in terms of, Energy, Stress or *Shakti*. Energy or

Movement is thus the fundamental principle in Matter.

That the secondary qualities such as colour, smell, etc., are effects wrought on us by the action of the primary qualities has been long recognised in Science.

§ 4

We have seen, how all the "primary" qualities believed to reside in "scientific matter" are modes and functions of energy which is of the essence of Matter. That is, Matter possesses mass, extension, resistance, weight, etc., *because* it is *something* which is *dynamic* and energises. Now, what is that *something*? How and why does it become dynamic? And what is the nature of the Energy which operates in and through it? These are the three fundamental queries regarding Matter.

As regards the second and third questions, Science confesses that she is not in a position to answer. It is true that Electricity is not uncommonly regarded as the most fundamental kind of physical energy, but physicists are not sure about the nature of Electricity. We do not yet know what it *is*, though we know much

about how it works. Can it be traced to something more fundamental than itself? Physicists no longer look upon Electricity as a continuous fluid flowing in and out of conductors; it is now believed to be granular or "atomic" in structure; that is, we have now grains, "atoms" or corpuscles of electricity entering like "companies," "battalions," "armies," etc., into substances and leaving them. These units of Electricity were called by Sir J. J. Thomson "corpuscles," and by Johnstone Stoney "Electrons". But what is this unit charge? Can we regard it as a vortex in Ether? How does it then take a positive and negative character out of vortex-motion? Is it only a difference in the *direction* of motion? The difference between a positive charge and a negative charge appears to be fundamental. Likes repel and unlikes attract each other. How is that effected? These questions probing to the very root of the matter still remain unanswered.

The common hypothesis, however, is to regard the electric condition as a condition of stress in Ether. The *something* which is stressed and strained is Ether, all forms of

energy (Electricity included) are forms of stress in Ether, and Matter with all its properties is the manifestation of such stress-and-strain in Ether. In this conception, we have only substituted the word "stress" for the word "energy"; but we are still far from clearly understanding its nature. What is this stressing in Ether, why and how does it stress? This is not known.

Energy is commonly stated to be the capacity for doing work; and Work is commonly expressed in terms of motion or change of configuration. In this way a 'formula' of Energy or Work may be given; but it is a description and not a definition; it never tells us what Energy or Capacity for doing work *is*. Clerk Maxwell, one of the greatest of British physicists, in his Matter and Motion said: "We are acquainted with Matter only as that which may have energy communicated to it from other Matter, and which may in its turn communicate energy to other Matter."

So, according to him, it becomes necessary to understand 'Energy' in order to understand 'Matter'. But what is Energy? "Energy" on the other hand, he says, "we know only as

that which in all natural phenomena is continually passing from one portion of matter to another." As a definition of Energy it involves the vicious circle. The inscrutable "that which" appears in both the statements. Taking again the famous Treatise on Natural Philosophy by Sir William Thomson (Lord Kelvin) and Professor Tait, we read (S. 207)—"We cannot, of course, give a definition of *Matter* which will satisfy the metaphysician, but the naturalist may be content to know matter as *that which can be perceived by the senses, or as that which can be acted upon by, or can exert, force.* The latter, and indeed the former also, of these definitions involves the idea of *force*, which in point of fact, is a direct object of sense; probably of all our senses, and certainly of the 'muscular sense'." The idea of force is the essence, and it is claimed by these authors, as indeed it has been claimed by all realistic philosophers, that force is a *direct* object of sense-experience—that in muscular activity in particular we directly apprehend what force is. Empiricists from Hume and Mill down to the physical empiricists such as Ernst Mach, Poincaré, Karl Pearson and others,

have objected to these definitions of Matter as being too metaphysical or even as being unpsychological. The inscrutable "that which" which occurs in these definitions refers to the metaphysical "thing-in-itself" as distinguished from phenomena; and force or energy which these definitions suppose to be a direct object of sense, is nothing of the kind at all: we are only aware of *changes* in our groups of sensations and *infer* objective causes of such changes (*i.e.*, things and forces). According to this psychology, then, Matter is for us only a "complexus of sense-experiences"; it will not even allow us to say with J. S. Mill that "Matter is a permanent possibility of sense-impressions" (System of Logic, bk. i, Chap. iii). For, the unwary may take even this to imply a supersensuous entity at the base of the sense-impressions!

Whether right or wrong, this view which apparently would not permit us to go beyond groups and series of sense-experiences and their changes to search after 'realities,' is, if consistently held, the *reductio ad absurdum* of all thought and all science. What we directly and immediately experience is a universe, and

this universe of experience is the Fact which is alogical and unspeakable.[51] It is by Thought (*Buddhi*) that we treat this universe of experience variously; this treating principle being, of course, immanent, and not transcendent, in relation to the universe of experience which is treated. How is it treated? It is treated by being veiled, by being changed or moved, and by being presented. If we call the treating operation, Stress, then clearly it has three partials as just indicated—presentation (*Sattvaguna*) movement (*Rajoguna*) and veiling (*Tamoguna*). For example I think I am now hearing the cooing of a bird; *really* this phenomenon is the exphasised part or section in a whole universe of experience which I now have; but this whole has been more or less veiled, so that I *appear* to have a particular sensation only (*viz.*, the cooing sound) at this moment. And the veiling of the whole, the prominence of a part, its passing away and coming into prominence of

[51] This is the position of Prof. P. N. Mukhyopādhyāya in his "Approaches to Truth" and "Patent Wonder" to whom I am indebted for the exposition of his case in this and other sections.—J. W.

another, presuppose movement. From this short analysis it will appear that the Empiricist can get his "clusters of sense-impressions" and "series of sense-impressions" only *after* his mind or *Buddhi* has treated, in the manner above indicated, the alogical Fact-Whole, and cut it up into segments and rearranged them according to certain basic *Sangskāras* (laws) of his Buddhi. His Empiricism is not *radical*; he is a dealer in second-hand articles—the so-called 'impressions' and 'ideas'. Radical Empiricism must bring us face to face with the Fact; and when it does so, it becomes *Radical Realism*, for then the Ideal and the Real become one. *This is the position of Vedānta.*

The Empiricist would have us believe that his "cluster" and "series" (*i.e.*, co-existence and sequence) of "sensations" are native to actual experience, while the Realist's "thing" and "attribute," "cause," "force" and "effect" are only thought-constructions foreign to actual experience. But this is an untenable position. Either say with Kant that all these (co-existence, sequence, thing and attribute, cause and effect, etc.) are thought-forms or categories only and are therefore foreign to the

"thing-in-itself" which we do not know; or say with the Realist that these are thought-forms *as well as* actual forms of the thinkable itself—that Thought thinks in these forms and ways *because* the thinkable has in reality these forms and ways. We cannot admit truths by halves.

The Vedântic position is as follows:

Reality is Experience. Experience is a Universe. This Universe lives, moves and has its being in Consciousness[52] or *Chit*. *Chit* therefore is Reality and the foundation of Reality. There is no inscrutable "thing-in-itself" beyond or behind Consciousness.[53] Far from being unknowable, Reality is Cognition itself. Now, the Universe of Experience which is, and appears in Chit, may be regarded by us from *three* standpoints. (A) As it is, without any limitations; this is the Alogical Fact which cannot be circumscribed by any category. (B) As the quiescent and transcendent as well as immanent ground of what we have; this is *Chit* as such or Shiva as the worshipper

[52] That is pure Consciousness unaffected by the operations of unconscious mind. See "Reality".

[53] *ib.*

personifies it; or, the same in its dynamic or stressing aspect—which is Shakti which is theologically the Devī or Mother. The two aspects put together, Shiva and Shakti identified with each other, give us the Alogical Whole or Fact. (C) The Universe of Experience is treated with reference to particular centres in it and their pragmatic interests. Time, space, causal relation, the relation of thing and attribute, and other categories do *not* apply to *Pūrna* or Absolute Whole; they arise and have their application when the *Pūrna* has by Its own stress finitized Itself into centres distinguishable from one another. So that when a Centre reviews the universe of Experience from its *own* point of view (*i.e.*, the Self), its review casts itself into the forms of certain categories: it thinks of a world existing objectively to itself in *Space*, consisting of *Things* and their *Attributes*, *causing* phenomena in itself, and changing in *Time*. And this is a *necessary* treatment of experience by a Centre: it cannot but do it. A Centre treats its experience in this fundamental way and in no other, because experience has *in reality* the basis of all these relations.

That is to say, Space, External Order, Time, Cause, Substance and the rest are no mere subjective dreams of the Centre: these *relations are objective arrangements as well as subjective representations of those arrangements*—which is Realism. The Vedāntist, therefore, differs from Kant in two essential respects: (1) He offers no unknowable "Thing-in-itself" beyond phenomena or Experience. His Reality is Experience. (2) Within this Experience certain fundamental operations go on; a particular Centre, itself born of those fundamental operations in it, reviews those operations from its own standpoint; by its review it frames its own "scheme" of the universe; and this "scheme" *is not essentially unlike the real scheme of the universe* because the universe is nothing else than experience; a Centre is nothing else than a "point-of-view" in it, and a Centre's review and thought of existence, evolved out of and governed by, the fundamental operations in experience itself, cannot be essentially unlike what experience, and therefore Reality, really is. The Laws of Thought are thus justified. These Laws cannot belie those fundamental dispositions and

operations of Reality which make them possible.

We need not therefore be shy to speak of a real Space, in which real Matter energises in real Time and really causes sense-affections to a given Centre. Only it should be clearly understood that the basis of all this is consciousness and the stressing in conciousness. The Shākta Vedāntist offers no Substance separate from its Energy, no *Shaktimān*[54] separate from *Shakti*,[54] but Indian Substance which is Chit *is* Energy. Man as a given centre, knows it in both the aspects (Substance-Energy), and as a member of the universal stress-system, he *directly* apprehends Energy in other Centres or the world for the matter of that. Action and reaction are correlative; there is no idea of the one without an idea of the other. When therefore he acts and feels that he is acting, he feels at the same time that something other than himself is reacting on him; *e.g.*, when he gives a blow to a thing, he feels his own force, and he feels that of the thing. It is a single feeling presenting two poles like a magnet.

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[54] Possessor of Power and Power.

Nor is the Hindu driven to look upon Conceptual or "scientific" Matter as something essentially unlike Perceptual Matter, or this latter as something essentially unlike real Matter or real Thing-in-itself. There is a tendency in science to regard Ether, Atom, Lines and Tubes of Force, etc., as "convenient fictions" or "conceptual models" only which have no perceptual equivalents; perceived Matter is also believed to be unlike the real Thing-in-itself. Thus "Scientific Matter" is *doubly* removed from the world of realities. This, however, need not be the fact. Since no "dark" world of things-in themselves exists, a given Centre's *resumé* of the universe is a *resumé* of the world of experience from its own standpoint (and therefore subject to its own Sankskāras or tendencies which may veil to a degree the Reality which is Experience or *Chinmaya*)[55]; but its *resumé* of Experience, and therefore, of Reality must be true as regards the fundamentals or essentials. For example, its *resumé* so far as it postulates a real Space, a real Time, real centres of force stressing upon

[55] That is essentially consciousness as *Chit*.

one another, a real Ether as the medium through and by which the mutual stresses are exerted, and a real universal Energy which is *Chit-shakti* (*i.e.*, of the nature of Will), is valid. Man's fundamental commonsense is not therefore common non-sense. However much science has sophisticated, Man's *essential* beliefs as regards the universe he lives in are *true*.

And what are the essentials of our *resumé* of Matter? In the first place, we postulate some sort of a continuum (*Vibhu, Vyāpaka*) whether that be a *vacuum* (*i.e.*, Space) or a *plenum* (*i.e.*, Ether); the *continuum* appears in two forms—static and dynamic; the first is Space or Ether, the second is Time; for, Time is the continuum regarded as a drift or flow. Both are forms of Substance-Energy which is *Chit*. In the second place, we postulate discontinuous, discrete "sections" (which may be reduced to points or *Bindus*) in the *continuum*; that is to say, the *continuum* must also be known and conceived by us as finitised, broken into discontinuities which are centres or points in it. This finitisation is the work of *Māyā-shakti* whereby the unlimited is experienced as limited. In third place, these centres

of discontinuity imbedded in a *continuum* are stressing upon one another, so that they are bound to one another as members of a universal stress-system. These being the three fundamental postulates of our *resumé* of Matter, we have a sufficient warrant for Ether, Energy and Centres of Energy (which appear as the "chemical atoms") which sum up Matter.

Because we cannot be mistaken as regards the fundamental postulates involved in our *resumé* of experience, it does not follow that our ideas about Matter, Life and Mind must all be the same and all be true. Each of us is a Centre and a particular standpoint; hence though we all agree as regards certain inalienable essentials of existence, we must differ as regards the forms in which those essentials may express themselves. For example, we cannot but be right as regards the continuum itself; it exists. But what is it? Is it a *vacuum* as was supposed by generations of physicists or is it a *plenum*? If the latter, what is its nature? How is Ether to be conceived? As an elastic Solid? As a perfect Fluid? As a perfect Jelly? Then again, we cannot but be right as regards the centres of discontinuity

in the *continuum*. But what are they? Chemical Atoms? Ether-elements in vortex-motion? A centre of strain in Ether? A centre of force? Lastly, we cannot but be right as regards the mutual stressing of the centres. But how is it exerted? Through wave-motion? By actual Lines and Tubes of Force as supposed, for example, by Faraday? So, the actual *forms* may be more or less veiled to a given conscious Centre; another may be better enlightened than he is; and so there is need of Science, Philosophy and Realisation by *Sādhanā*.

Further, our placing the foundations of Matter in Chit-Substance-Energy has relieved us of the necessity of partitioning Reality into Matter, Life and Mind and then trying hopelessly to link them up again. We have nothing else than Experience. Matter, Life and Mind must be modes of Experience. The Essence of each is Chit-Substance-Energy or Shakti. If, therefore, Matter be spiritualised, and Mind be materialised and both be vitalised, we merely solve an equation. The fundamental laws of Matter, Life and Mind are not exclusive and peculiar (*sui generis*).

All Energy is *Chit-shakti* or Consciousness-energy. This Energy has two forms—the agent which does work; and the instruments with which, and the material upon which, work is done. Energy appearing as agent (*Kartā*) is technically called *Chit-Shakti*; and Energy appearing as instrument and material (*Kārana* and *Upādāna*) is *Māyā-Shakti*. In every form of existence, sentient or "insentient," living or "non-living," Energy must appear in both forms. Thus there must be *Chit-Shakti* or Energy as agent in a so-called "atom" of Matter also. It cannot be wholly *inert*, *i.e.*, moved by external impact alone like a billiard-ball. It must have (as Shākta doctrine holds) its own stock of spontaneity. It must have its own domestic economy of intra-atomic energy, which is controlled by the "self" or *Ātmā* of the atom. And does not the Science of to-day recognise this? She now puts a tremendous amount (almost limitless) of Energy into the tiny atom; and She recognises some sort of domestic government in the atom, by which the "sub-atoms" move in a certain order according to certain velocities, are sometimes pitched off (as in Radio-activity) when they

overstep a certain "critical" velocity; by which the atom itself may evolve into a different kind, and may even dissolve into the sea of Ether and its stock of universal and fundamental Energy. The basis of this arrangement in, say, an atom of Hydrogen, is the "self" of that atom of Hydrogen—its Energy appearing as agent. And this is *Chit-Shakti*, its *Abhimāni Chaitanya* or *Adhishthātrī Devatā*, which, as appearing in H, may be more veiled than as appearing in a "living" corpuscle (C. H. N. O.), or as appearing in the cave of Intelligence (*Buddhi-guhā*) of a rational animal; but still it *is* and *works* in the atom of Hydrogen. So in the unitary system of existence, there is perfect fraternity between man and the "meanest" particle of Matter. What is here in him is also *really* there in that, and *vice versa*. Like him that also has its action (*Karma*), its enjoyment (*Bhoga*) and its release from all bonds (*Apavarga*) through *Abhyudaya* or progression in the course of upward evolution into man and from man to God.

Hence the three fundamental queries regarding Matter with which we opened the present section can be briefly answered according to Vedāntic Doctrine in this way: (1) The

something which affects our senses as Matter is *Chit*-substance-energy (Shakti). (2) It is *essentially dynamic* and its dynamism works eternally in certain lines, so that we cannot justly speak of its acquiring a dynamic character or dynamic tendencies at any time. It works, and *this* is what is meant by saying that it is Energy. Laws of Work (*Karma*) are the Laws of Energy. Energy works as an atom of Hydrogen rather than as an atom of Oxygen, *because in the former case its Karma has been, is and will be different from that in the latter case.* Its being H is therefore determined by its *Karma.* It is however not immutable, as was thought by the older generations of physicists. All Matter is slowly radio-active—which means that all Matter is slowly transmuting, evolving; a conclusion which must inevitably follow from Sāngkhyān and Vedāntic principles. It transmutes by its stresses, *i.e.*, by its *Karma.* (3) And this "Material" Energy is Consciousness-Energy analogous to what we experience in attention and will.[56]

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[56] Energy, though mutable, is indestructible. "She who sports on the breast of Mahākāla has neither beginning nor end—neither birth nor death."

The *whole* operation goes on in *Chit* which, regarded as a quiescent background or frame, is the *Chidākāsha* or Ether of Consciousness. Man has direct experience of this too in the *Samādhi* or ecstasy of completed Yoga.

§ 6

We have seen that Continuity and Discontinuity have both their bases in our universe of experience; Thought therefore is not fanciful when it conceives a *continuum* in which discontinuous or discrete centres (*Jīvas*) are in action and reaction. The need of a continuous *plenum* or Ether (*Ākāsha*) and that of the Atom (*Anu*) are therefore real needs; we cannot do without either. Those physicists who discard the Ether cannot discard the *continuum* of Space and Time. Those again who look askance at the "atom" or "corpuscle" cannot do without "centres of force" or "points where given *quanta* of Energies operate".

The continuous and the discontinuous must have no rigid limits set to them. The ideal limit or perfection of a continuum is not Scientific Ether (about which the scientific doctors differ), but is in Vedānta the Ether of

Consciousness (*Chidākāsha* which the Chhāndogya calls *Jyāyān* and *Parāyanam* (*i.e.*, greater than the greatest—*Mahato Mahīyān* as also *anoraniyān* smaller than the smallest) and the ultimate Ground and Support of all things or God. Similarly, the ideal limit of the discontinuous is not the scientific atom or electron, but the *Bindu* which is a focussed condition of Shakti or Energy of God or more strictly God as Energy. The Nyāya-Vaisheshika *Paramānu* which is a point of stimulation is also as already stated not so crude as the scientific atom or electron.

In the search after the ideal limit in either direction (*viz.*, continuity and discontinuity—*Mahat* and *Anu*—), it is necessary to pass through a series before the ideal is reached—Ether of Consciousness on the one hand and the ideal Shakti-Bindu on the other. In other words, we must have a *Continua*-series and a *Discontinua*-series—a series of largeness and a series of smallness. The upper limit of the first is *Chidākāsha* and the ultimate limit of the second is *Bindu-shakti.* It is always well to remember these two series and their limits; if we do not, we shall not understand the search after Ethers

and Corpuscles in Science, nor the genesis of the sensible world as given in the Vedānta Book of Genesis. The latter starts with the ideal limits; hence its First Principles cannot be *completely* rendered in terms of Scientific Ethers and Electrons. Nevertheless these serve a purpose as far as they go. They give us a sort of rude "first sketch" of Nature as, in the words of Dr. Bertrand Rusell, Newton's Physics gave of the ways of Nature some two centuries ago.

Between the uppermost limit and the lowermost we have a series of *continua* and *discontinua* arranged in ascending and descending orders; and all these intervening orders of largeness and smallness, continuity and discontinuity are susceptible to strain and stress in a varying degree. The *Bhūtas* or "Elements" arise out of this variable stress-and-strain attitude. A Shāstric parable may be taken to represent the birth of this series. Aditi, the Vedic mother of the Devas, literally means that which cannot be divided or cut: She is as such the continuum in the limit or perfection. She is the Perfect Ether. In her womb, Vāyu or Maruts are born. Vāyu means, in the world-aspect, the

(relative) continuum in movement. It is the Moving Ether. Now, Indra, jealous of the strength of this Devatā about to be born, enters Aditi's womb and cuts it up into segments. Let Indra represent here *Chit-shakti* by which the undivided continuum in movement is divided into a number of "components" of the movement. In this way, Vāyu becomes in fact the Maruts (plural) which are said to be 49 in number.[57] The single continuum in movement thus evolves, under the action of *Chit-shakti*, a series of moving *continua* which are the *Marud-gana*. Every Devatā, it should be remembered in this connection, has a physical aspect. For all that is, is an Epiphany of the Divine.

The problem before Physics as well as Metaphysics is this: Assuming that the Absolute Continuum is X and the Limit of Discontinuity is Y, how and where shall we place, between these two Limits (*Chidākāsha* and *Bindu*), Sky, Air, Water, Earth, Life, Mind (*Antahkarana*), and the rest? How shall we fit our actual order of experience into this framework? Science in

[57] See volume on "Life".

the West is solving, though hardly as yet suspecting the Ideal Limits, this Problem; Philosophy in India has also attempted to solve it. One solution of Science is that Matter is non-matter (*i.e.*, Ether) in motion. What does it mean and how near to Truth does it bring us? This we shall next see.

§ 7

No one of the Six Standards or Points of view of Indian philosophy [58] looks at matter from the physico-chemical point of view. They consider it from the standpoint of its effect on the mind and senses. Matter in this view is *that* which, affecting the mind and senses, produces therein the sensations of hearing, touch, form and colour, taste and smell. The first Standard differs from the rest in its treatment of sound and hearing (v. post), but they agree also in this, that matter is both gross (*Sthūla*), that is, sensible, and subtile (*Sūkshma*), that is, unperceivable by the senses but by mind alone. What then is *that* which produces these sensations? Here the standards differ. It is

[58] See "Reality" by same Author.

necessary, in the first place, to understand the Indian classification of magnitude.

There are four kinds of magnitude—small (*Anu*), large (*Mahat*)—terms relating to solid or three dimensional magnitude; short (*Hrashva*), long (*Dīrgha*)—terms which relate to linear magnitude. The first standard also considers (VII.1.11.14.17) these two pairs of categories as giving rise to two series (*Dhārā*), *e.g.* A is smaller than B, B than C, etc., one series. A is shorter than B, B than C, etc. There are six possible combinations of these four magnitudes, *viz.*, (1) *Anu-Mahat*, small-large; (2) *Anu-Hrashva*, small-short; (3) *Anu-Dīrgha*, small-long; (4) *Mahat-Hrashva*, large-short; (5) *Mahat-Dīrgha*, large-long; (6) *Hrashva-Dīrgha*, short-long. The first and sixth combine contraries (VII.1.10) and are, therefore, cancelled. The third is also untenable, because a thing which is small in dimension cannot be long. Similarly, a thing which is large in dimension cannot be short and the fourth goes out leaving only the second and the fifth as logically tenable combinations. Each of these magnitudes has its degrees. Thus *Anu* which is small and atomic may represent several

degrees of which the extreme limit or infinitely small than which there is nothing smaller is Paramānu.[59]

According to the first standard (*Nyāya-vaisheshika*), gross transient, sensible matter, is that matter which is large (*Mahat*) and consists of many parts and has form in itself. Compound matter is constituted of certain aggregates called Ternaries (*Tryanuka, Trasarenu*) which are the smallest tri-dimensional, and therefore theoretically perceivable, aggregates consisting of three couplets or Binaries of two points each ; such points being called *Paramānu.* The single Ternary though theoretically perceivable is in practice not so. The Binaries and Points are unperceivable. Perceivable matter is of three dimensions and infra-sensible matter, or matter unperceivable by the senses exists as a Binary of two dimensions or as a Point without magnitude. The smallest particle of tri-dimensional matter is theoretically perceivable,[60] that is provided the requisite sense-capacity is there. In any case it can be

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[59] Parama (supreme) and Anu.

[60] Pratyaksha-yogya.

actually imaged, and since it possesses both primary and secondary qualities it can be concretely imaged. The annotators who in some cases possessed neither the Yogic vision [61] of the ancient Seers,[62] nor the knowledge of modern science, often represent the Particle or *Trasarenu* as a moving particle visible to the eye, such as a mote seen in a sun-beam as a pencil of light, let through an aperture into a dark room. It is said to be composed of three Binaries (*Dvyanuka*) and broken up into six "atoms" (*Paramānu*). But this cannot be so, as even a microscopic particle must according to Western science contain multi-millions of corpuscles. A Particle or *Trasarenu* is an "element" of solid dimension in sensible matter. It has a magnitude of three dimensions namely length, breadth and thickness. It is thus the solid element of matter. The Particle or *Trasarenu* is composed of three Binaries or *Dvyanuka* which have neither breadth nor thickness and which are "elements" of linear dimensions.[63] The Binary

[61] Yoga-drishti.

[62] Rishis.

[63] Dl in mathematical notation.

again is composed of Points. Two Points, not touching, make a short line of which the breadth and thickness or solid dimension are nothing. Next, two such elements of linear dimension (*Dvyanuka*) are combined. From a common origin or point of reference two short lines are drawn in two different directions thus producing a very small surface or "element" of surface dimension.[64] If again three such short lines are drawn from a common origin at say right angles to each other there is produced an element of solid dimension or volume.[65] Three binaries make in this way a perceivable Particle or *Trasarenu* or Ternary, the magnitude of which is much greater than that of a Binary, for the former has breadth and thickness which the latter has not. Hence compared to a Binary it is large (*Mahat*). Again many

[64] Ds in mathematical notation.

[65] *Dv* in mathematical notation. It appears to me that this scheme of the Nyāya Vaisheshika is referred to by what in the Tantras are called the crooked or bent line (Vakrarekhā), the straight line (Rijurekhā) and the prismatic form (Shringātaka) of which the Devatās are Vāmā, Jyesthā, and Raudrī. See Yoginīhridaya Tantra, p. 167. From the curved line said to be in the form of an elephant-goad (Angkusha) representing surface dimension; a line is drawn upwards into another plane and the tridimensional figure is formed.

lines must be bundled together like slender wires, twisted into a rope, to produce even a very small volume; each of the constituent lines is short but the aggregate of these short lengths is comparatively long (*Dīrgha*). Hence the magnitude of the Ternary or *Trasarenu* is large and long (*Mahat-Dīrgha*) just as the Binary is small (*Anu*, because lacking solid dimension) and short (*Anu-hrashva*).

We have next to consider the ultimate Points or Atoms which go to make up the Binaries, the Ternaries and the combinations of these which, as molar masses, form sensible matter (Bhūta). I call it an atom, not because it is like the atom of Western Science, but because it is the true atom that is an indivisible partless point of substance without any of the three dimensions and relative to its effect a Point of Force, whereas the atom of Science and even its electron has some magnitude, however minute. Without this explanation the translation of the Point or Paramānu as atom is misleading. The "measure"[66] of the *Paramānu* or true atom is called *Parimandala* which means literally a

[66] Parimāna. See Vaish., VII. 1. 20.

"sphere". It is therefore an infinitely small sphere or Point (*Bindu*). Each series (*Dhārā*) of the four categories of magnitude has a superior [67] and inferior [68] limit.[69] If A in the series is the inferior limit, and if it be absolutely small, then it is the Atom or *Paramānu* just as Z may be the superior limit and absolutely great,[70] such as the Self (*Ātmā*) and Ether (*Ākāsha*). Between these two limits there are several orders relatively great or small. If the *Paramānu* or Point had any finite magnitude, however small, like the scientific atom or electron then it would not be the inferior limit—the partless unit. Hence the infinitely small unit is nothing greater than a Point (*Bindu*). The same reasoning will apply to the other pair "Short-long". The infinitely short thing is again a Point. If it had any finite length it would be divisible. So the inferior limit of the second series is also the *Paramānu*. It is a *Parimandala*

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[67] Utkarsha.

[68] Apakarsha.

[69] thus in the first series (see p. 74), A may have the smallest and Z the largest magnitude.

[70] Parama-mahat.

because it is a sphere of which the radius is infinitely small, that is a Point. Things of perception are seen to be divisible into smaller and smaller particles. All these are spheres of finite, however small, radii. So are even the electrons of science. Pushing however to the limit we get a sphere of which the radius is infinitely small and this is *Pārimāndalya*. In all physico-mathematical analysis of things in Science, we have to imagine and deal with the "volume elements". A mere Point or mere Line cannot be an object of concrete imagination for us—we cannot perceive it even with the eye of imagination. Such perception becomes possible only when we take a solid element. Neither the Point (*Paramānu*) nor Line (*Dvyaṅuka*) are that, and are therefore unperceivable. The smallest solid element is the *Trasarenu* which is theoretically perceivable, if there be the requisite sense capacity which ordinarily there is not. The chemical atom, electron and so forth, being larger or smaller solid elements, fall under the generic category of the Ternary or *Trasarenu* for they cannot be either the Binary or *Dvyanuka* or the unit or *Paramānu* which are not thus perceivable or imaginable by

us. They are supersensible[71] or transcendental, not in the sense that while too small (such as a *Trasarenu*) to be perceived by the unassisted senses or aid of instruments hitherto invented they could be perceived by the senses with the aid of ideally perfect instruments, but in the sense that they can never under any circumstances be perceived by the senses. They can only be conceived by the Mind. The Points are also non-spatial that is to say they cannot occupy space or localised position.[72]

Before describing their nature it is necessary to enquire how from the Points as things of no magnitude, things of magnitude are produced.[73] The sensible is either visible or invisible, such as the aerial atmosphere which is limited and consists of discrete parts, otherwise there could be no movements in it, for in an all-filling continuum no parts of it can move from their places, nor can other parts come in from some other quarter. All sensible things are of limited extent and as such discrete consisting of parts. A thing of limited magnitude may be

[71] Atīndriya.

[72] Pradeshātīta.

[73] See Hindu Realism by J. C. Chatterjee, 25 *et seq.*

produced by things already having magnitude, or by a number of things without magnitude, standing not contiguously but at distances from one another and then entering into a combination of unification so as to form a single unit which, as a whole, may behave as one individual, and in which the originating parts are no longer entirely independent of the whole, in which case the originating parts or factors need not have any magnitude whatever. The unified wholes are secondary or produced units or individuals.[74] The constituents are not contiguous but have spaces between them for the discrete sensible is never an absolute solid.[75] A Point which is contiguous to, and thus coinciding with, another Point remains a Point, but standing apart produces a Line. A number of pure lines that is having only length, which are not less than three, can produce a thing of solid tri-dimensional magnitude that is length, breadth, and thickness. Contiguous lines produce only a line just as the contiguous Point

[74] that is a new thing, an individual (Avayavin) other than a mere aggregate.

[75] things can be operated upon by heat and can be compressed.

is nothing but a Point. But if the lines stand apart and in two planes, their combination produces a figure which is a thing of tridimensional magnitude (*Trasarenu*) which by the addition of Mass becomes perceivable to all.

Why it may be asked should the ultimate constituents of matter be without magnitude? Because in the first place thought cannot rest there and will subdivide again and again as long as any magnitude is assumed. And next it is seen that things with magnitude may be produced from things without magnitude. Thirdly if the ultimate constituents of sensible things were composed of solid, hard, and extended particles with magnitude, however small, then the Ether could not be all pervading. The Points without magnitude which are the ultimate constituents of matter being partless cannot, like discrete things composed of parts, be produced or destroyed and are eternal.[76] Gross sensible matter is non-eternal. What then is the *Paramānu* the ultimate constituent of sensible matter but itself beyond the senses? In the first place it

[76] Destruction means division into component parts.

is not an infinitely small element of what we actually experience which are all compounds, but it is an infinitely small partless Point of Substance (really existing and entering variously into compounds) which is the ground and cause of four classes of sensation, *viz.*, Touch, form and colour, taste and smell.[77] It is a real and independently existing Force and self-subsisting stimulus, producing both the sensible and sensation.[78] As sensation is fourfold, they are, as the cause of it, of four classes technically and symbolically called "Air," "Fire," "Water," Earth".[79] This does not mean that they are what we call such, which is gross compounded matter because they are respectively and in particular manifest in pure air which may be felt through its motions and temperature, which may be seen in all fiery substances, tasted in watery form (for the flavour of a thing is only had when it is dissolved into liquid form) and which may be smelt as

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[77] In Sanskrit Sparsha, Rūpa, Rasa, Gandha.

[78] The Paramānus originate both sensible matter and the particular sense. The senses are of the same nature as the stimuli which provoke them.

[79] Vāyu, Tejas, Ap, Prithivī.

solid matter.[80] The aerial *Paramānu* is the ultimate constituent of that form of Matter from which all other sensible special qualities can be eliminated except Touch; the fiery, watery, and earthy Paramānus are the ultimate constituents of those forms of matter from which all other sensible qualities can be eliminated but not colour and form, taste and smell. Therefore the Vāyu Paramānu is a material point which produces gross measurable matter sensible as touch and the sense of touch, just as the rest *Tejas Paramānu*, *Ap Paramānu*, and *Prithivī Paramānu* produce gross matter sensible as colour and form, taste, and odour. V. P. has the quality of touch and feel only; T. P. has this and colour and form: A. P. has the two last and the property taste, whilst P.P. has the last three and as its own inalienable characteristics the quality of odour. V, T, A, P exist in two forms one subtle and eternal[81] and

[80] Water may be smelt, but if so it is due to the presence of solid matter in it. Pure water is without odour. "Earth" does not mean only what is popularly so called but any solid substance, *e.g.*, flesh, flower, fruit in so far as the same are solids. Both earthly, that is gross sensible, fire and air are compounds.

[81] Sūkshma and Nitya: existing even during the dissolution of the world.

the other gross and non-eternal.[82] The former is the ultimate supersensible unit or minimum[83] and the latter is sensible matter formed by the aggregation[84] of the ultimate units according to a definite order of combination, *viz.*, binaries or couplets (*Dvyanuka*) and Ternaries (*Trasarenu*). At this last stage matter becomes theoretically fit for perception,[85] or as it is called *Bhūta*, though in practice it only becomes perceivable when it becomes large and consists of many parts.[86] Thus as we have seen the subtle *Prithivī Paramanu* itself possesses and produces the four kinds of qualities in gross *Prithivī* or *Prithivī Bhūta*[87] (P.B.). It has therefore colour and form (*Rūpa*) and the rest, but its form is not such as can be apprehended by the senses.[88] When the object becomes large and has many parts, and

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[82] Sthūla, Anitya; arising only on the "creation" of the world.

[83] Charama Avayavī or Paramānu.

[84] Sangyoga.

[85] Pratyaksha yogya.

[86] Mahat and has many Avayavas. Vaish., IV. 1. 6.

[87] Bhūta is the nearest expression for the sensible matter of science.

[88] Udbhūta.

has form in itself, it becomes an object of visual perception. For the mere existence of form in a thing is not enough for its being perceived by the eye. To be perceivable it must possess such form as brings it within the range of our normal sense-capacity.[89] The Paramānus or Material Minima have infra-sensible mobility, form, taste, and smell, which originate these qualities in sensible matter as the gross object of perception.

The first Standard in its description of the *Paramānus* omits one quality namely Sound (*Shabda*) which is also perceived by a single and special sense namely hearing. For it does not regard sound as a property of discrete sensible things. It may be eliminated from all of them for they all may be conceived as absolutely silent. Sound may be said to be common to all things, in that it may be produced by means of any of them but at the same time there is no sensible thing which cannot exist without it. But though sound is not a property of the discrete sensible it must, as a quality which is not

[89] That is Rūpa-vishesha or Udbhūta Rūpa. Thus the pollen dust of scented flowers floating in the wind excite the sense of smell but not that of sight.

subjective, inhere in a Reality and that Reality is the Continuum or Ether (Ākāsha). The sense of hearing is essentially of the same nature as Ether itself, and so with the other senses which are essentially the same as the stimuli themselves. The sensations produced by these stimuli existing in the Continuum (*Ākāsha*) are taken up and co-ordinated by the Mind which is here called *Manas* and passed on it by it to the Self (*Ātmā*) in which Consciousness inheres.

§ 8

In the second Standard (Sāngkhya-yoga), Matter is not, as in the preceding Standard, something which, either in gross or subtle form, is eternally separate and distinct from Mind. In the second Standard Mind and Matter are phenomenally distinct, but are in their ground and during the dissolution of the universe, one. That is they are each transformations[90] and modes of the one Natural Principle[91] from which both evolve when such

[90] Vikriti.

[91] Prakriti.

Principle is associated with the Selves[92] who are Consciousness. According to this doctrine of evolution[93] the cause evolves into the effect and yet, as cause, remains what it is. As effect it is modified that is the effect is the cause modified. All which exists is a transformation of one substance, their cause. Causation is transformation; cause and effect being different positions of the same thing in the time sequence, the antecedent position being the cause and the consequent position the effect. The Natural principle as the source of Mind and Matter has three factors or *Gunas*—*Sattva*, *Rajas* and *Tamas*. The meaning of these is simple but has been obscured. The Natural Principle, which is a principle of unconsciousness, works in association with Consciousness which is itself quiescent. What is its effect? It may do one or other of two things. It may obscure Consciousness, in varying degree, or it may similarly reveal Consciousness. When it is said that *Sattva* "reveals" Consciousness what is meant is that it does so

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[92] Purushas.

[93] Parināma.

relative to the operation of Tamas. Consciousness is self-revealing.[94] The Natural Principle is an obscuring and negating one (for the *Gunas* are ever inseparate) but not always in the same degree. In so far as and to the extent that it suppresses the specifically obscuring factor (*Tamas*) it reveals Consciousness and is called *Sattva Guna*. In so far and to the extent that it suppresses the revealing factor (*Sattva*), it obscures Consciousness and is called *Tamas*. But both these actions involve activity and this is the *Rajas Guna*.[95] As all which is in the effect is in the cause, and as the effect is the cause modified, it follows that these three Factors are factors of Mind and Matter and the whole universe is composed thereof. In some things one factor more prevails and in varying degree than in others. Thus *Tamas* most prevails in what is called gross inorganic matter, and yet also even here in varying degree. But even in such former Matter *Sattva* is not altogether absent, for *Sattva*, *Rajas* and *Tamas* never exist separately

[94] Svaprakāsha.

[95] Rajas makes Tamas active to suppress Sattva and makes Sattva active to suppress Tamas.

from one another. It follows then that this inorganic Matter also reveals consciousness in its degree. When we pass to the lowest forms of vegetable life there is a greater display of *Sattva* though there is *Tamas* in very great degree. As ascent is made through higher vegetable, lower animal and higher animal forms until we arrive at Man, *Sattva Guna* (revealing Consciousness) more and more increases and *Tamas Guna* lessens. In Man the increase is observed to range from the rudest of primitive men to the Yogin whose consciousness is united with the Supreme Consciousness.

The order of evolution of what are called the Tattvas shows the development of the various mental and material principles. The evolution is not a temporal but a logical one. All the evolved principles are immanent but latent in the ultimate Natural Principle. By evolution they become manifest. In this Standard start is made with the association of the two Principles of Consciousness (the many *Purushas*) and Unconsciousness (the one *Prakriti*), the first of which is inactive and eternally changeless, and the second is eternally active. Change actually takes place in the Natural

Principle, though owing to the association of Consciousness with the latter, change seems to be observed there also. What is evolved? The experience of past worlds. Everything which will appear is already there potentially in the Natural Principle. On the dissolution of the previous universe all is merged in the Natural Principle and becomes a mere *Sangskāra* or tendency, which, in its most fundamental form, is a disposition towards manifestation as the world of finite experience. In this general disposition lie implicit all the particular tendencies and experiences which manifest as the world of man, animal, vegetable and inorganic matter. How and in what manner does the evolution of tendency into manifested form take place? In the first place by the autodynamic evolution of the Principles (*Tattva*) which constitute all manifested being. The first production of the association of Consciousness and Unconsciousness and therefore the first transformation of the Natural Principle is the Principle (*Tattva*) called *Mahat*[96] or *Buddhi*. To

[96] Mahat=great or massive: a good description for the experience is a massive one. Another derivation however of the word is from Maghas or Light.

understand this state most easily we should go to our own individual experience which is a microcosmic form of what appears in the world at large. When a man (say X) drops into dreamless slumber he is in the state of dissolution (*Laya*).[97] Let us suppose that he very gradually awakes from his slumber and slowly regains his waking consciousness. The first experience is a vague one of *mere being*, with a sense of limitation no doubt, but as yet without defined *centre*. Thus the sleeper has first the experience of being without the experience that it is *he* X who is that being. He is not yet to himself an "I" (*Aham*). There is a vague sense of awareness without reference to a conscious self. Then it comes to him "It is I (X) who went to sleep and am now awaking. The sense of limitation is deepened. Then he X observes with greater and greater detail the *things* around him and takes up to-day the thread of experience from yesterday, interrupted by sleep. And so with the universe. It falls into dreamless sleep in the Natural Principle and passing through the dreaming state

[97] This dreamless state (*Sushupti*) is not as some suppose the same as Liberation (*Moksha*).

awakens again to the world. It is again to be remembered that in the first state or *Buddhi* there is in addition to *Buddhi* as it is in itself all other principles and experiences in a latent state. A person in the first state of awakening from dreamless slumber has only a vague sense of being. But therein lies implicit the experience of all particulars which that person has had or will have.[98] So in the second state in which the sense of I (*Aham*) emerges—a principle called the "I—maker" (*Ahangkāra*)—there is patent both *Buddhi* and *Ahangkāra* and there is latent all other principles and experiences and so on with the rest of the Principles (*Tattva*) to which I now turn and which have both a cosmic and individual, or macrocosmic and microcosmic aspect.

The first sprouting of the seed of Tendency in Substance as the Natural Principle (*Prakriti*) is that transformation of it which is called *Mahat* or *Buddhi*. Here the cosmic tendency

[98] There is a particular experience which Western literature might call "hypnagogic" but to me real in which the world is known and understood without being seen in its form as particulars. It may occur "accidentally" but I was told of a Yogī who knew how to bring it about

Sangskāra as *Avidyā* or the ignorance of the whole which renders knowledge of the section possible is actualised.[99] This form of Cosmic Energy is the first manifested form of volition towards definiteness of being and direction of evolution. There is at this stage no finite centre but a mere undefined experience of being (the first mere awareness of the awakening sleeper) containing within it the potency of every definite form which is ultimately to evolve from it. It is as if the Will to Become assumes definite shape and direction and decides on a definite line of evolution. *Mahat* however as a state of Cosmic volition is merely a massive determination to change in which the "How" and the "What" of the operation are still implicit. Substance then transforms Itself into a Centre. This is the stage of the individualising principle, the self-arrogating,[100] "I making" principle called *Ahangkāra* or *Asmitā Tattva*. This Cosmic Ego or centre of

[99] The Bhāshya quotes Bārshaganya Rishi as saying that the true or whole view of the Gunas that is Cosmic Power is not had in ordinary experience. What we call the present view of a thing is only a cross section of the whole in which past, present and future unite.

[100] Abhimāna.

operation in the Cosmic Stuff must be distinguished from the individual Ego, who only appears with the completed evolution of all the psychic and physical principles. From the individualising Principle in which the self as *Buddhi* and *Ahangkāra* or psychic functioning have as their object an experience of limited general being in which all particulars are implicitly contained, we pass to the stage in which those particulars become explicit. There is evolved first and together that aspect of mind (*Manas*) which is the chief and controller of the senses (*Indriya*), the ten senses of perception and action (*Jnānendriya* and *Karmendriya*) and the five *Tanmātras* which are generals of the sense particulars or universals. These *Tanmātras* take the place in this system of the *Paramānus* of the first. They will be found compared in detail in the volume "Mind". They are the subtle form of matter and from these by compounding and accretion of mass, gross matter (*Bhūta*) is produced namely that fivefold form[101] of the one Substance when sensible, and which affects the senses in five

[101] As Àkāsha ("Ether"), Vāyu ("Air"), Tejas ("Fire"), Ap ("Water"), Prithivī ("Earth").

different ways as Sound, Touch, Colour and Form,[102] Taste, and Smell [103] through the corresponding senses of hearing, touch, vision, taste and smell. From the subjective standpoint each form of Matter is the corresponding psychosis objectified. From an objective standpoint the five forms of Matter are five forms of motion. "Earth" and the rest are at the lowest or gross end of the scale. Earth (*Prithivī*), the characteristic of which is obstruction, is that form of motion which produces cohesion, whilst at the highest end Ether (*Ākāsha*) the characteristic of which is non-obstruction, being the medium in which all other things and motions are, is non-obstructive all-directed motion, radiating in all directions. Between these is first locomotive motion (*Vāyu*) upward motion giving rise to expansion (*Tejas*) and downward motion giving rise to contraction (*Ap*).[104]

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[102] The two go together. No form is perceived unless there is colour.

[103] Shabda, Sparsha, Rūpa, Rasa, Gandha.

[104] In the Tantra Shāstras each of the Bhūtas is symbolised by a colour and form. Thus earth (*Prithivī*) is yellow and is represented by a square cube to denote the notion of solidity. The same notion of solidity is denoted by the elephant who upholds the cube.

As previously stated the Shākta system may, in a general way, be understood if we accept the Sāngkhya scheme of the evolution of the 24 Tattvas but in a Monistic sense. In lieu of the many selves (*Purushas*) there is one Supreme Self who is Shiva the God or Good, and in lieu of the Natural Principle or Prakriti there is the Power (*Shakti*)[105] of God or Shiva represented under feminine form as His Consort. The "tender"[106] Prakriti, as the Sāngkhyas called Her, was separate from and independent of the Selves, but Power (Shakti) and the Possessor of Power (Shaktimān) or Shiva are one. Even the phrase Possessor of Power is an accommodation, for in their ultimate sense,[107] Shakti=Shiva. Each therefore of the Principles (*Tattvas*) and forms or *Vikriti* of *Prakriti* in the Sāngkhya are forms of power (*Shakti*) of the Supreme Power (*Mahāshakti*). Therefore the universe which these principles compose, is self-evolving Shakti or Power.

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[105] As Chit-Shakti that is Consciousness as Power and Māyā Shakti that is Power as Māyā or as instrumental and material cause.

[106] Komala.

[107] that is as Consciousness: Shakti as Chidrūpinī.

God in one aspect, that is as Consciousness-Power (Shakti) evolves as the Universe, and yet in another as Consciousness (Shiva) remains unchanged.[108] What is further peculiar to this system is that it adds twelve further Principles or Tattvas to the twenty-four. It explains how both Prakriti and Purusha, as understood in this system, were themselves evolved. But as these earlier Tattvas deal with the evolution of consciousness before and as a preliminary to the manifestation of the world of duality it is dealt with in the volume on Consciousness (*Chit*). The nature of Matter as above described is not affected. Matter is a form of the Supreme Power and as such is composed of the five forms of motion above described.

As already explained[109] Shakta doctrine or the Doctrine of Power (Shakti) is a form of Vedāntic monism which possessing elements of its own uses also others drawn from the

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[108] Just as in Sāngkhya one Tattva evolves into another and remains what it was as cause. Thus Buddhi produces Ahangkāra and yet remains Buddhi.

[109] See "Reality" in this series.

Sāngkhya. As regards these elements Nyāya-Vaishesika teach *Yaugika-srishti*;[110] Sāngkhya-yoga teaches *Yaugika-srishti*[110] and *Parināma-srishti*;[111] Vedānta teaches *Yaugika-srishti*,[110] *Parināma-srishti*[111] and *Vivartta-srishti*.[112] Shākta doctrine teaches in its own way also all three though being a practical system of Theology and Ritual its own *Vivartta-srishti* is conceived in a different manner[113] and it adds an *Adrishta-srishti* up to the appearance of Purusha and Prakriti Tattvas according to the scheme of the thirty-six Tattvas.[114] Its conception of "Matter" however is not substantially different from the Sāngkhyan and Vedāntic views above described.

§ 9

We have seen that in the search after the ideal limit of discontinuous (*i.e.*, granular)

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[110] Creation by combination of previously given Elements.

[111] Creation by evolution; the product existing in a potential form prior to actual manifestation.

[112] Creation where the originating Reality remains what it is and yet bring about the effect according to Advaita Vedānta apparently; according to Shākta practical doctrine, really.

[113] See last note.

[114] See "Shakti and Shākta" where this scheme is explained.

matter, we must pass through a series [*e.g.*, "body," "particle," "molecule," "atom," "sub-atom" (or Electron) and "prime atom"], and also that we have to pass through another series in our search after the ideal limit of continuous matter (*i.e.*, homogeneous, non-granular, seamless) through Ethers of increasing subtlety until we come to the Chidākāsha or Ether of Consciousness itself. The physical unit in Science (as distinguished from the chemical unit which is the "atom") is now the Electron (as unit charge of Electricity); but the Electron has a definite mass and dimensions as compared, for example, with those of an atom of Hydrogen; and since it is so (*Sāvayava* and *parimita*), it cannot be the ultimate unit. G. Johnstone Stoney, who invented the name 'Electron' says [115] "Here, then, the electron is introduced to us as a new entity. Is not it, too, a complex system within which internal events are ever taking place? And when this question can be answered shall we not be in the presence of the inter-active *parts* of an electron? And do not the same

[115] See Preface to "The Electron Theory," by E. E. Fournier d'Albe (1909), p. XX.

questions arise with respect to these? For there is no appearance of there being any limit to the minuteness of the scale upon which Nature works. Nothing in Nature seems to be too small to have parts incessantly active among themselves." So the Electron need not be partless.

Coming then to the other series, we note this that since scientific Ether is a medium which is capable of being stressed and strained (*i.e.*, changed in form or configuration,) we must be able to conceive "grains" or elements in this so-called continuum itself; for, change of configuration presupposes the existence of parts which *have* a configuration or relative positions with respect to one another. Thus it is impossible to conceive a vortex-strain in a sea of Ether otherwise placid, unless this sea is composed of grains or elements which can change their places. There can thus be no halt at scientific Ether, just as there can be no halt at the scientific Electron. In fact, physicists have sometimes imagined a granular structure for Ether; as Professor Osborne Reynolds who in his "The Sub-Mechanics of the Universe" conceives Ether as a sea of

indefinite extent composed of uniform spherical grains (smaller than the electrons) which are in relative motion with one another. Strain-forms pass through them as waves pass over water. A Commentator on this theory says:[116] "Matter is a persistent strain-form flitting through a universal sea of æther: we have explained matter in terms of æther. Æther in its turn is described as a fairly close-packed conglomerate of minute grains in continual oscillation: we have explained the properties of the æther. So be it. But what of the grains of which the æther is composed? Are they 'strong in solid singleness' like the one-time atoms of Lucretius? Or have they parts, within which opens a new field of complexity? Of what substance are they made? Has a new æther more subtle than the first to be invoked to explain their properties, and a third æther to explain the second? The mind refuses to rest content at any step in the process. An ultimate explanation of the simplest fact remains, apparently for ever, unattainable."

[116] W. C. D. Whetham, "The Recent Development of Physical Science" (1904), p. 294.

An ultimate explanation in terms of science of That Power Whose ways are inscrutable (*anirvāchya*) is not to be thought of. But, on the other hand, in seeking after the ultimate ground of things, it is best not to be groping in the dark or chasing after elusive theories. The Ether of Science, for example, has now become something of which it is not possible to form a physical conception.[117] What is it like? Is it stagnant or moving? What are its properties? These questions cannot now be answered; the only conception of Ether as a medium is this that it satisfies a number of differential equations associated with the names of Clerk-Maxwell, Lorentz, Larmor and others. Some physicists are therefore seriously asking if such an Ether is not a mathematical fiction only. Even the positive evidence of the

[117] Prof. Emile Picard, "La Science Moderne," 134, after pointing out that bizarre theories and contradictions have lessened the enthusiasm and provoked some discouragement amongst scientists says: "Il a pu même paraitre à quelques uns qu'il était étrange d'expliquer le connu par l'inconnu, le visible par l'invisible, d'imaginer par exemple, comme on l'a dit, un éther que nul aeil humain ne verra jamais." Then in the usual way he refers to it as an useful image provided that we do not pretend to have attained reality. But its utility if real is a guarantee of its reality.

Hertzian electric waves and wireless telegraphy does not convince some minds as to the real existence of Ether. At any rate, if a real Ether should exist, it is a hopeless task to give a rendering of it in mechanical and physical terms. The same difficulty meets us in the other direction. The Chemical atom has now been weighed and measured; the Kinetic Theory of Gases as well as other means now enable us to count the number of atoms or molecules in, say, a cubic inch. The number of particles in a cubic inch of air in the ordinary state of the atmosphere is represented by a number which is approximately 3 followed by 20 cyphers. Now, these particles having definite weights and dimensions cannot obviously be the physical minima; in fact, it has now been possible to go beyond the chemical atoms and discover the sub-atoms which also in their turn have been weighed and measured. We are therefore impelled to push farther. The common tendency in science to-day [118] is to regard

[118] Recent Development of Physical Science, p. 282. See also Sir Oliver Lodge's "Modern Views on Electricity" where Electricity is regarded by him as a condition of Ether.

the Prime Atom as a sort of strain (probably, rotational, gyrostatic) in Ether. This, however, is something which has been dematerialised. According to this view, then, an electron or unit charge of electricity is a centre of intrinsic strain, probably of a gyrostatic type, in an æther, which is also the medium in which are propagated the waves of light and wireless telegraphy. Moreover, the electron is identical with the sub-atom which is common to all the different chemical elements, and forms the universal basis of matter. Matter, at any rate in its relation to other matter at a distance, is in this view an electrical manifestation; and electricity is a state of intrinsic strain in a universal medium. That medium is prior to matter, and therefore not necessarily expressible in terms of matter; it is sub-natural if not super-natural. Matter itself therefore becomes Non-matter in motion. But notwithstanding all the equations in Hydro-dynamics, it is not known why and how a Non-matter can move gyrostatically or otherwise. The physicist's enquiry or quest in both directions (*i.e.*, continuum and atom) therefore brings him sooner or later to a

confession of ignorance; his attempt to explain matter in terms of Ether is only explaining the unknown by the still more unknown.

We therefore require a surer ground than theory and mathematical analysis to go upon in our quest. We find that surer ground in experience. We must start from and upon that and rest in that also. Theory and mathematical analysis have their use, but only if they proceed upon the firm ground of Experience. If it should posit any Ether, that Ether must have its warrant in Experience; if there be any strain-centres in it, our Experience must be able to vouch for them. If there be any stresses or energies, these also must be such as our Experience can guarantee. In one word, Experience must be in a position to stand surety for all the essentials of any theory, pending its actual verification by Experience in all the details.

Now, we firstly ask this: Is a continuum *given* in our Experience? If so, what is it? Our Experience, as we have pointed out before, is a universe apart from the action of pragmatic interests which narrows it down to particular sections or segments such as (the noticing of the star Sirius in the sky in a clear night).

Now, this world of Experience or measurable is felt by us as a manifestation in Chit. This Chit is the boundless *plenum* or *continuum* (the Brahman which means the Immeasurable, the Immense) in which, and of which, the whole manifestation is. This therefore is the basis of all *continua* that we may require and search for. It is the basis and prototype of the Ether (or Ethers) of Science, of Space and of Time. *Chit* is no theory; its being a continuum is not theory. It is the Fact.

We secondly ask this: Is any strain-centre given in our Experience? If so, what is it? How does it form? Is it permanent or passing? Does it change so long as it remains? The key to all this is in actual experience. I am directly aware of myself as a stress-and-strain centre or *Jiva* (strain presupposing stress), inasmuch as I know myself as a "point-of-view" distinguishing myself from the rest of my universe and yet as being its point of reference; and also, practically or dynamically, as a centre of power at which and through which forces converge and diverge (resulting in incessant actions and reactions) throughout the universe. Thus my being the unifying Principle of apperception,

and a Centre of Power is a fact. It is also a fact that this Principle and Centre presupposes and accepts a universe in which operate similar other Principles and Centres. For, there can be and there is no stressing for a solitary Centre in a perfectly homogeneous continuum. Plurality of correlated centres is therefore a necessity. Nay; I directly experience it. Whenever I function, I feel that my functioning has relation to, is addressed to, and conditioned by the functions of other Centres. In other words, my being a member of a joint stress-system to which others also contribute is a direct experience. Whether or not those other Centres all live, feel and think as I do, is another matter; but *all* are stress-centres; my having a universe of Experience means my finding myself as one in a system of stress-centres; and each stress-centre or point of Power (Shakti) is also necessarily a strain centre, *i.e.*, a point that has, through that Principle in Being which is *Asmitā* or *Ahangkāra*, individualised and distinguished itself somehow on account of its manner of stressing.[119] What therefore impresses

[119] That every person or thing including the minutest coherent particle of matter is regarded as a self follows

me as Matter must ultimately be such stress-and-strain centres in rapport with me as a centre. The atoms of Chemistry, the "sub-atoms" and so forth of physical theory are only more or less crude guesses or approximations to these Centres. These guesses may be invalid in part; but there cannot be any doubt about the Centres of Stress in *rapport* with us which our Experience directly gives. *Chit* as the Primary Continuum, and *Bindu-Shakti* as the Primary Individual, are not therefore unknown; with respect to them, we cannot pretend to say "we are ignorant".

Further, to make joint partnership and co-ordinate interaction possible, all the centres in my universe must be like me in all the essentials. In this sense, there is a fundamental truth in Leibtnitz' theory of monads. Any two monads, A and B, are alike if we take into account both what is latent (potential) and what has become patent (kinetic) in each. Dynamically, it could not be otherwise.

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from the fact that every thing which exists including both subtle and gross matter is derived from and is a product of the individualising or centre-making cosmic Power which is called Asmitā or Ahangkāra.

Take a particle of dust here on earth and an incandescent gaseous particle in a distant star. They seem to be unconnected. But really each expresses in its way the entire stress-system which the universe is. So it is said that man and all other centres is a microcosm (*Kshudra Brahmānda*). A passage from the Vishvasāra Tantra says *Yad ihāsti tad anyatra*—"what is here is elsewhere"—*Yannehāsti na tat Kvachit*—"what is not here is no where". To understand this passage we must include both the latent and patent power as potency, and power as manifested. The given position, composition, properties and relations of the one cannot be *completely* understood without taking into account the entire stress-system of the universe. In this way, the whole universe is given in a particle. A given particle, however, in virtue of its peculiar position in the universal stress-system, has or appears to have a given set or round of operations which constitute its own *Karma* and determine its separate individuality. These are its patent or kinetic *Karma*. But in virtue of its peculiar position in the universe-system, it has also the potentiality of other operations which are its latent or potential *Karma*. A

load which is lifted from the ground and placed at the top of a building, has a potential energy by virtue of its position;[120] so when the load again falls to the ground it does work on account of that potential energy. A string put to the bow has thus potential energy by virtue of its position. So on and so forth. Hence, any particle or any centre in the universe has, besides its kinetic or patent *Karma*, a store of potential energy by virtue of its place in the cosmic system. As in the examples of the load and the bow-string, the stock of potential energy is determined by previous kinetic actions, *e.g.*, lifting of the first and stretching of the second. The potential energy again determines future *Karma*. The potential energy which is not patent until it expresses itself in kinetic action, is called *Adrishta* (lit. what is not seen). Every Centre has thus its *Karma* and *Adrishta*, which both completely considered, give us the entire cosmic Energy. Hence, any Centre, A=any other Centre, B; because, A's whole kinetic energy + A's whole potential energy = B's whole

[120] Kinetic Energy is Energy of Motion, while Potential Energy is Energy of Position or Configuration.

kinetic energy + B's whole potential energy = whole cosmic energy = Brahman (the Immense, the Whole or *Pūrna*).

It follows from the above analysis that the difference between me (as a Centre or *Jīva*) and a particle of dust is *not* in the *sum* of the Energy which I represent and it represents, but it is in the peculiar *distribution* of that sum-total between kinetic energy and potential energy; that is, I divide the sum-total into a certain proportion of kinetic energy and potential energy which is *not* that of the particle of dust; my *Karma* and *Adrishta* are thus *distributively* different from those of the particle. And this special proportioning of *Karma* and *Adrishta* on my part and on its, depends on, or is incidental to, our respective positions in the cosmic system. Position again is determined by *Karma* and *Adrishta* (*i.e.*, their proportion); *Adrishta* is determined by *Karma*, and *Karma partly* by *Adrishta*. And this cyclic causation is beginningless. The Vedāntists say that *Karma* is *partly* determined by *Adrishta*, because, contrary to the rigid determinism of Science, the Vedāntic position is this that *Karma*, even in a so-called material centre,

cannot have its essential freedom or spontaneity completely veiled and suppressed. *Chit-Shakti* is free, and through every centre of its operation, its essential freedom must also vent itself, as also the other fundamental aspects of it, *viz.*, Being-Feeling-Consciousness-Bliss; such expression may however be, and commonly is, subject to the operation of its own correlate *Māyā-shakti* or *finitising* principle by which its essential nature may be variously veiled and treated, but never completely suppressed or negatived.

Position in the cosmic scheme is position in Space, position in Time and position in the tissue of Causality. In one word, it means place in the curve of the life of the world. And this, as we have seen, is determined by *Karma* which produces *Adrishta*. *Karma*, as already mentioned is ultimately of *Chit-shakti* and as such its freedom or spontaneity can in no case be completely veiled or effaced. An atom, for example, was formerly treated as a hard particle which moved in obedience to external forces only and had no choice of its own, no energy of its own (*i.e.*, apart from external impacts or impressed force). But the

atom of modern science is a complex system of sub-atoms, and in virtue of the motions and positions of these latter within itself, it possesses an almost limitless stock of kinetic and potential energy in a state of relatively stable equilibrium; the energy thus stored up, and as evidenced by radio-activity, is so great that if we could make it available to us and control it, then we should be able to do all the work of the world by its means alone, without requiring to burn coal to produce steam, electricity, etc., or to make chemical explosives. Control over the intra-atomic energy is a tremendous *Siddhi* or Power. We may illustrate by a Vedic parable which says that Indra (*i.e.*, for illustration let us suppose *Chit-Shakti*) let loose the cows which had been shut up in a cave by the Asura (Pani, *i.e.*, Māyā-shakti). The cows are the forces which are stored up and concealed in everything (by the Veiling Principle in Nature) which is therefore like a cave. Now, what about this vast amount of intra-atomic energy? Does not an atom possess spontaneous action on account of its own store of power? Can it not choose to move and work in a manner which is *not* determined by the external

influences alone? That it can is proved by the evidence of radio-activity which, as Sir E. Rutherford and others define it, is a *spontaneous* activity on the part of the atom which apparently does not depend on, and cannot be influenced by, the ordinary chemical and physical means (chemical action, great heat and cold and so forth). Precisely by such spontaneous activity, the atoms give out their radiations and emanations which are of enormous dynamic value, and they evolve and transmute. It appears therefore that the atom has its own work (*Karma*) and tendency or *Sangskāra*. It is describing its curve of life according to the equation of its *Karma* (including *Adrishta*) as I am doing. It may be that on a future day, it will be possible to give a mechanical account of the atomic system in terms of the motions and positions of the sub-atoms in it, just as we now give a mechanical account of the solar system. But even then the question will only be shifted. In the first place, that mechanical account (*i.e.*, account in terms of Newton's Laws of Motion and their corollaries) will be possible only by " limitation of the actual data "

or by abstract analysis. The concrete, the actual always baffles attempts at a mechanical explanation; it is only the abstract, the conceptual obtained by "limitation of the data" which has so long been amenable to mechanical or deterministic treatment (which begins by assuming that things are inert in themselves and have therefore no spontaneity). It should be remembered that the machine-made "things" of Physics are not exactly the things as they exist and as they act. In the second place, supposing that Physics is able to prepare a mechanics of the intra-atomic system in terms of the motions and positions of the sub-atoms, the question of "inertia or spontaneity?" will still arise with regard to the sub-atoms themselves, *i.e.*, with regard to the total activity of the components of the sub-atoms (for, the sub-atoms cannot be the ultimate units). There cannot be rest until we come to the *Bindu-Shakti* which, as a centre of operation of the *Chit-shakti*, must be essentially a centre of spontaneous or free energising. Man's own experience of himself gives him, it is said, the warrant for so thinking. The appearance of intra-atomic energy has, it is true,

disturbed the quiet faith of the physicist in conservation of Energy, for it has upset all his calculations so far made, as it has come as a new factor never before suspected. But the doctrine in so far as it maintained that the sum-total of energy in the universe always remained constant [121] was unpsychological and therefore untrue; no absolute bounds can be set to the magnitude of Energy in the universe which is *Chit-Shakti*; *e.g.*, we cannot draw a line and say that the sum-total of Energy can only be so great as that, but can never exceed that. The Mother Power (*Mahā-Shakti*) cannot be circumscribed and measured; and the symbol pictures Her as nude.[122] 'Unmeasured' and 'immeasurable' are Her true characteristics. Man's Will, for example, is a tap through which new Energy is being continually drafted into the universe: He is no mere "points-man" on

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[121] See Emile Picard, La Science moderne, 133 *et seq.*

[122] The Mother is said to be space-clad (Digambarī) because She is Herself free from the covering of Māyā though wielding that Power: Her Body is dark blue because She pervades the World. See A. Avalon's "Hymn to Kālī". In Kamalā Kānta's Sādhakaranjana it is said that "Māyā is the Ākāra (form) of Nirākara (formless) Brahman. The Shūnya or 'void' is formless until encircled by Māyā".

the cortex of the brain switching off and directing existing energies therein: He is in Vedānta a creator. At any rate, he draws upon a Bank which Physics was not prepared to charter.

Lastly, if he interrogates his own experience he finds that the generic and homogeneous condition precedes the particularised and heterogeneous condition (though the recognition of the former may be a later phenomenon). He finds also that particularised and heterogeneous states of experience have a tendency (which is sometimes periodic) to lapse back into the undifferentiated state from which they sprang. A *Sāmānyāvasthā* (undifferentiated condition) giving birth to a *Visheshāvasthā* (differentiated condition), and this again returning to its ground—is a fact of experience, and a fundamental fact. Empirical psychologists in the West of the last generation were too busy with their "atoms" of sensation, their "laws of association and synthesis" to recognise this order. To-day, however, we know better. Now, what does the fundamental fact referred to mean? It means this: Man as well as every other centre is a system of tensions or tendencies (*Sangskāras*). These may

periodically (or at times) be (normally or by effort) in equilibrium (*Sāmyāvasthā*). What does *this* mean again? It means not that the tensions themselves have severally vanished (so that his energy then becomes a sum of zeros), but that their resultant ("algebraic sum" as the mathematician would say) then becomes in-effective. This again means that then his dynamic system lacks a special direction of doing work. This is its *Sāmyāvasthā* which is an undirected (or "scalar") condition.[123] But presently by the "catalytic" action of Chit-shakti this spell of equilibrium is broken.[124] It is to be noted that without such spontaneous action or *Sangkalpa* of the Chit-shakti, there is no reason why *Sāmya* or equilibrium of the entire cosmos once established should again be broken, and also why *Vaishamya* or dis-equilibrium once set agoing

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[123] *e.g.*, in Sushupti, or dreamless sleep, Samādhi or Ecstasy, the state of just waking, the state just before falling asleep, etc.

[124] *Cf.* the meaning of the Gāyatrī Mantra in which Chit is thought of as impelling our Buddhi (*i.e.*, stress-system) in all its states. In catalytic action one thing affects another by its presence without itself being affected. And this is the action of Purusha in the Sāngkhya.

should again revert to equilibrium.[125] By the breaking of the spell, lines of force or directions of tendency effectively manifest themselves. These are the Jatājāla of Vyomakesha beginning His cosmic dance. These directed tendencies are in mathematical parlance "vector" quantities doing work in definite directions.

Now, this fundamental of Experience is a fundamental of the universe also, for the latter *is* the former. Taking Matter, therefore, we can say that the grains of Matter of various grades (prime atoms, sub-atoms, atoms, molecules, etc.) are born out of an homogeneous or undifferential Substance; that all their differing tensions arise out of the dis-equilibrium of that primordial stuff; and that after their varied *Karma*, *Adrishta* and *Sangsriti* (evolution), they at last come under the influence of the Cosmic Chit-Shakti or Lord as the Supreme Self (*Parāhantā*) to equilibrate their tensions, and thus return to their starting ground. Modern Physics too in working out its Law of Dissipation of Energy contemplates

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[125] In this respect the Sāngkhyan doctrine of Prakriti and Vikriti is rightly criticised by the Vedānta.

such periodicity in cosmic equilibrium and dis-equilibrium.[126] Hence Matter is a periodically appearing and disappearing, (and evolving while in appearance), strain-form in "non-matter". The first undirected condition of the stress-system is called, in the Mantra-Shāstra, *Nāda*; which passes into that which is called *Bindu* in which it is about to manifest itself in definite directions or lines of force, (for, without points, directions or lines have no meaning), and its manifestation on its threefold division into Known, Knowing, and Known is the multiple varied and finite universe, the limited expression of infinite Power. Modern Physics too, it may be noticed, cannot do without super-natural agency (*i.e.*, miracle) in explaining the appearance of discontinuities in the homogeneous continuum and their disappearance in it (if indeed they should disappear).

The existence of polarities (*e.g.*, that between the positive and negative charges of Electricity) by which attractions and repulsions in the universe are sought to be explained, are grounded

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[126] Herbert Spencer's work in this connection.

in Experience as the fundamental *dvaita* (dichotomy) in Consciousness as Shiva-Shakti, Static-Kinetic, Chit-Māyā, Subject-Object, "*Aham-Idam*".[127] Attraction between the dissimilar poles means their tendency to return to the condition of Whole (*Pūrna*) whose aspects they are and yet from which they appear to have become separate. Attraction (*Rāga*) is thus the return-current tending to lead to the *Pūrnāvasthā*: in the "conscious" plane it appears in its form as *Rāga* in the sense of Love. So Love makes us whole (*Pūrna*). By reason of this coalescing tendency, the Subject ("I") draws towards itself in perception and volition its Object ("This"), so that perceiving and willing is really an act of equating and owning. Shakti in the universe is always tending towards satisfaction (*Ānanda*) and *Ānanda* being Shiva Himself, this cosmic tendency is only the love of the "Divine Pair" (*Divya Dampati*):[128] the Supreme *Hangsa* or "Bird" swimming in the Lake of Consciousness. Static and Kinetic Energies also presuppose,

[127] See A. Avalon's Kāmakalāvilāsa and "Shakti and Shaktā" where the development is shortly given.

[128] See Kāmakalāvilāsa, V.

require and "complete" each other. But if this return-current or coalescing tendency were not retarded by an opposite current, the univere would at once sink all its distinctions and polarities and there would be no difference or *Bheda*. The world's very existence therefore presupposes a *pratibandhaka* or obstacle to complete union. This *pratibandhaka* is *Dvesha* (repulsion). In the "conscious" plain it appears as Hate or Resistance. Similar centres of the same pole thus repel one another. *Their* attraction would give but one pole, one aspect or "half" of Reality; while the meeting of two centres from the opposite poles would give a complete centre of Reality. So one "I" ejects another "I" (*i.e.*, cannot *directly* make an object of it),[129] but readily attracts "this" or "that"; in Biology similar sexes are rivals; in Physics similar "charges" repel each other.

So starting on the ground of our "given" Experience, we are enabled to establish on a

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[129] In the sense that I cannot *directly* know and feel your thoughts and feelings *as such* in your Mind. I have to infer them from what you say or express by your bodily expressions. This is the sense in which "ejecting" is used here.

sure footing the essentials of a right conception of Matter. To sum up :

(1) The unit of Matter is a stress-and-strain centre ultimately in *Chit* which as Pure Experience is the Perfect Continuum.

(2) The Perfect Continuum of its own power or Shakti becomes first a massive undifferentiated Continuum (*Nāda*).

(3) And then *Bindu* as the condition of Power which manifests as centres or points of differentiated mass.

(4) The mass of a given centre is a function of its motion (*Karma*) which, though subject to position (*Adrishta*), is also spontaneous.

(5) Consequently, by *Karma* the mass of a centre may accelerate (*i.e.*, change), and it may thus become a different kind of centre, *e.g.*, one kind of Matter may evolve into another kind, into "living" matter, into "feeling" matter, into "thinking" matter.

(6) The "point-charges" have polarities on account of which they attract and repel one another.

(7) Periodically, these strain-centres have a tendency to dissolve in the continuum (*Nāda*), which is their *Pralaya.*

(8) Strain presupposes Stress (Energy), and this is fundamentally *Chit-Shakti* or *Chit* as Power and is unmeasurable.

§ 10

Summing up the teaching of the six systems, the First Standard (Nyāya-Vaisheshika) proposes nine *Dravya*s or Entities, *viz.*, *Kshiti*, *Ap*, *Tejas*, *Vāyu*, *Ākāsha*, *Kāla*, *Dik*, *Ātman*, *Manas.* Of these, the Ātman or Self is the substratum of consciousness (*chaitanya*) and experience (*jnāna*). Hence, if we define an 'objective' reality as that which exists in its own right beyond consciousness and experience, then all the other eight *dravyas* are objective realities. That is, experience or no experience, they exist. They (including mind as *Manas*) are unconscious Principles. So as regards Matter, the First Standard agrees with Western Science in so far as the latter makes it or treats it as an extra-mental reality. There are, however, important points of disagreement between the

two also. In the first place, Western Science draws a distinction between Primary qualities and Secondary qualities and regards the former set alone as really inhering in Matter and elements of Matter, whilst, according to it, the Secondary qualities are only effects produced upon a percipient Subject by the Primary set. The First Standard recognises no such partition. [130] The *Gunas*, *Karmas* and relations exist in the things themselves. For example, Prithivī, or matter stimulating the sense of smell, possesses fourteen qualities (*Gunas*), and these fourteen include what in Western parlance are primary and secondary qualities. Its material *minima* or *Paramānus* also possess both sets of qualities, and they originate both these sets in sensible matter because they themselves possess both. [131] One of the fundamental maxims of the First Standard is this: *Kārana-bhāvāt Kāryya-bhāvah.* [132] This, as the *Upaskāra* of Shangkara-Mishra explains, means—*Kārana-guna-pūrvakā hi kāryya-gunā bhavanti*—the

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[130] See my Volume in this series "Reality".

[131] The Paramānus originate the corresponding senses: thus the Prithivī Parāmanu produces the sense of smell.

[132] Vaisheshika Darshanam, IV. 1. 3.

gunas in the effect are due to the previous existence of them in the cause.[133] Now Prithivī in its gross, or compounded sensible form possesses *Rūpa*, *Rasa*, *Gandha* and *Sparsha* or luminous, flavoury, odoriferous and thermal matter.[134] *Prithivī* is either eternal (*Nityā*)[135] or non-eternal (*Anityā*). The former is the ultimate unit (*charama avayavī* or *Paramānu*) of *Prithivī*; the latter is *Prithivī* formed by the aggregation (*sangyoga*) of the ultimate units according to a definite order (*Dvyanuka*, *Trasarenu* and so forth). Though the different schools of interpretation of the First Standard differ as regards the unchangeability or otherwise of the *Gunas* in the *Nityā Prithivī* or *Prithivī Paramānu*, yet all agree as regards the possession of the four kinds of *Guna* by it. This therefore is *prima facie* an important

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[133] Also, Vaisheshika, II. 2. 24.

[134] "Rūpa-rasa-gandha-sparsha-vatī Prithivī"—Vaisheshika, II. 1. 1.

[135] "Sada-Kārana-vannityam" (Vaisheshika, IV. 1. 1.) A Nitya object is defined as a "Sat" or being which has no Kārana or cause. It is self-existent, if a Dravya or Entity; if a Guna or property or a Karma, it must be unalterable as existing in its Dravya. Alteration presupposes causation or Kārana.

point of difference between Western Science and the First Standard.

In the second place, the primordial motions and aggregations (*i.e.*, at the time of creation) of the eternal *minima* are explained by the First Standard by an extra-material influence (*i.e.*, by the ripening of the *Adrishta* of the selves or *Ātmans* and those of the *Paramānus* themselves). Hence though regarding the *Paramānus* as the material cause of the world, it postulates a spiritual efficient cause also. Western Science has not so far made up its mind as regards this great question. "Uniformitarianism" is becoming an exploded creed not only in Biology, Geology, but in Physics also. That is to say, the physicist can hardly maintain now that the cosmic order has practically existed in the same form from eternity and will continue to do so for ever. He can hardly maintain this creed even as regards what he calls his "fundamentals". By the Law of Dissipation of Energy all the higher forms of Energy are being dissipated into Heat; and Heat also by its universal radiation is tending to a condition of equilibrium which, when established, will render all flow or

radiation of Heat impossible. Heat is believed to be a motion or quiver (*Spanda*) of the "molecules" of Matter; perfect equilibration of Heat throughout the universe will mean therefore the equalisation of the motions of the molecules of Matter. That is, the molecules will *all* move or quiver equally when perfect equilibrium has been established. But Physics cannot stop at the moving molecules. It must go farther and consider the motions of the Atoms, Sub-atoms and Prime-atoms. In the so-called "atom" of Chemistry there is a vast store of Energy due to the motions of the Sub-atoms, which Energy is also (as is evidenced by Radio-activity) being more or less slowly dissipated. Hence, taking these into account, we come at last to Ether in which certain "strain-forms" (*i.e.*, the electrons, etc.) are moving equally: that will be the state of equilibrium of Ether. Then there will be undifferentiated (*Sajātīya* or *Samāna*) motion, but no differentiated (*Vijātīya* or *Vishama*) motion.[136] But can the Mind stop here too?

[136] In the Mantra Shāstra in the four states of Parā, Pashyantī, Madhyamā and Vaikharī states of Shakti as Shabda, located in the centres or Chakras (see A. Avalon's

What is a 'strain-form'? How is it produced? Does not a strain imply an in-equality or heterogeneity in the stuff? The motions of the strain-forms are equalised; but the very *existence* of the strain-forms in different positions in a continuum will imply non-equal motions at the basis of the strain-forms themselves.[137] Hence, either of two positions is possible: (*a*) Say either that cosmic equilibrium is established when the motions of all the elements in the universe *severally* vanish, so that all movements stop; (*b*) or say that equilibrium is established when the component motions, without severally vanishing, produce a resultant which is nothing or practically so. We say "practically nothing" because the resultant of the cosmic motions (or forces), without being zero, may be an effective something, but a constant—an invariable something. When

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"Serpent Power". Motion is first general and undifferentiated (Sāmānya) of which "Om" is the Mantra expression, then special (Vishesha) and lastly fully and clearly particularised (spashtatara) as Vaikharī.

[137] Though the strain-forms may be otherwise identical, yet the very fact that they exclude one another and keep to different positions in the Continuum implies that the forces behind them cannot be the same; they have differing *adrishtas* within the meaning of the previous sections.

the resultant is zero, the cosmic system as a whole will not move at all—it will have no evolution (*Parināma*). When the resultant is effective but an invariable something, the cosmic system will continue to move in a given state, which is *Sadrisha Parināma*; and so long as the resultant is invariable, the system will not deviate from its given state. This is about the cosmic system as a whole. But what about the component things and elements in it? These being the component forces of the system must also either continue unaltered, or so alter relatively to one another that their resultant may remain unaltered. But this latter alternative will not give us dissolution or *Pralaya*, (to which the scientific principle of Dissipation of Energy also points), for then also, *ex hypothesi*, particular things and groups of things will continue to move and move in varied manners. There will therefore still be an universe (*Sangsāra*). Hence true dissolution of an universe (*Pralaya*) will imply either the stoppage of all motions distributively and collectively in the universe, or the continuance of all motions, distributively and collectively, in the universe in the same given state of

non-manifestation or potentiality (*Avyaktā-vasthā*). The first is called *Parināmābhāva*, the second is *Sadrisha Parināma.*

Now, so far as the *Paramānus* are concerned, the First Standard adopts the first view. The Second Standard (Sāngkhya) adopts the second. The Third Standard (Vedānta) adopts the first view, but dispenses with the *Paramānus* as the persistent elements of the universe. It distinguishes between the static (non-moving) and dynamic (moving) aspects of the world, and believes that Motion may proceed out of Non-motion and lapse back into it. The basis of this belief is Experience.

Western Science is also now dimly conceiving the possibility of the cycle of Appearance (*Srishti*), Continuance (*Sthiti*), and Dissolution [138] (*Laya*); but its ideas are still unsettled on the subject. It deals with Ether and strain-forms in it. But if there should be dissolution (*Laya*), what would become of these? Would

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[138] The Devatās of which are Brahmā, Vishnu and Rudra and their Shaktis. Srishti and the other two are not merely applicable to the first appearance of the universe but, during its continuance as a whole, manifest as molecular birth, life, and death.

Ether be undifferentiated itself, and therefore, without the strain-forms? If so, how can strain-forms arise again? How again can perfect homogeneity be effected in Ether? Does not the final reduction of all strains or heterogeneities in Ether imply a super-natural action—a "miracle," in short? Does not again the appearance of strains in a perfectly homogeneous Ether imply a miracle? Or, in order to avoid the miracle, will it say that the tendency of the existing world is towards perfect equilibration of all energies; but that such perfect equilibration is an infinitely distant event, so that dis-equilibrium and heterogeneities will always continue, though gradually becoming evanescent? Or again, will it take up a position like that of the Second Standard?

For Science these questions are still unanswerable. But She must note this that if, in tracing out the world's curve of life, She makes the curve double upon itself—*i.e.*, if the curve going in a certain manner and in a certain direction should turn back and retrace its course—then, to explain such "critical" changes of direction or "nodes" at least, She

must invoke the "miracle"? She is so anxious to ban. Nothing short of "miracle" or spiritual action will enable her to get heterogeneity out of homogeneity and *vice versa*, disequilibrium out of equilibrium and *vice versa* and evolution from involution and *vice versa*. Spiritual action is a miracle to her, because She still makes Matter and Spirit *two*; but if they be *one*, then the action of the former is really the action of the latter, and then there is either no miracle or all is then miracle, for the commonest of experiences is so.

The First Standard believes in this commonest "miracle" of spiritual action upon Matter, though for it Matter is a substance different from the Spirit or Ātman. During *Laya*, the *Paramānus* are dissociated and stationary (*achala*). For their first *Priyā* (*i.e.*, motion) they require *Prayatna-vadātma-sangyoga*, *i.e.*, the association of Ātman energising. *Kusumānjali*, a celebrated work on the First Standard, argues that at the time of *sarga* or creation the *Paramānus*, which are inert and disconnected, require the causal activity of *Ātman* energising in order to move and come into contact with one another,

because such moving and associating is a *Karma*, and *Karma*, as in our bodies, requires the causal energising of Ātman to be produced. '*Ātman*' in the case of creation means '*Paramātman*' or *Ishvara* (Lord), and 'causal energising' means '*Prayatna*' (Volition). The association of *Paramānus* into *Dvyanukas* (couplets) requires therefore *Ishvara-Prayatna* or the Lord's Will. But then the question arises: Why should A couple with B and not with C or D? Why is there such preference in coupling when the creative action is just beginning? The Lord's Will which is the efficient cause of such coupling cannot have preferences of its own. Therefore there must be intrinsic though latent differences or tendencies in the material itself. These tendencies are the *Adrishta* of the *Paramānus*. As explained in a previous section, an *Adrishta* is the Energy of Position in the universal configuration. Even during dissolution (*Laya*) the discrete *Paramānus* have certain positions relative to one another. But they do not move then, and therefore they have then a static configuration. Where are they configurated? In Ether (*Ākāsha*) which is eternal (*Nitya*); and *Kāla*,

Dik[139] and the Self or *Ātmā* also remain then. What therefore God's Will as efficient cause does is this—it realizes or actualizes the tendencies (*Adrishtas*) of the *Paramānus* themselves; it helps their release or manifestation (*i.e.*, the translation of their static energy into kinetic energy). Then again, a 'tendency' implies a relation; it presupposes duality (*Dvaita*); for a solitary thing (whether *Anu* or atomic or *Mahat* or immense) in the universe, there is no tendency. There must be actually two or more things; or duality (or plurality) must be latent in the given solitary substance, or else it must be assumed to have power to appear as many (*Cf.* "*Eko'hang bahu syām prajāyeya*" "One am I, May I be many"). Now, the *Paramānus* of the First Standard are always many, and therefore they have their tendencies (*Adrishtas*) always in relation to one another, and also in relation to the "Selves" or *Ātmans* which, in this Standard as well as in the Second, are also many.[140] In relation to the Self, bodies, and

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[139] That is the forces which move things on and hold them in position giving rise to the notions of Time and Space, see "Reality".

[140] (Vaisheshika, III. 2. 19, 20, 21).

therefore the *Paramānus* which are their ultimate constituents, are objects and instruments of enjoyment[141]; and the Self is the enjoyer.[142] Hence the *Adrishtas* of the *Paramānus* are partly, if not wholly, determined by the *Adrishtas* of the non-liberated Ātmans. In fact a given *Adrishta* as a given relation between A and B, has two correlatives; so that, if for example it is the *Adrishta* of A to be the enjoyer (*bhoktā*) of B, then by virtue of the same fact it is the *Adrishta* of B to be the enjoyed (*bhogya*) of A. An *Adrishta*, as we have seen is but a tendency, a static or potential condition of what is to be (*drishta*); therefore, it requires an impetus, an efficient cause to be realised or actualised. So long as the universe is in movement, and *Paramānus* and groups of *Paramānus* are in movement, a particular *Paramānu*, or body, or self finds or may find such an impetus for the realisation of its *Adrishta* from the movements of others; but on the eve of creation when, according to the First Standard, there is no movement at all, the impetus can come only from a transcendent

141 Bhogya, Bhogāyatana, Bhoga-sādhana.

142 Bhoktā.

source. This transcendent Source is the Lord's Will, and by it, as the analysis has shown, the *Adrishtas* or arrested tendencies of the *Paramāṇus* and the rest are released and become effective. This is creation (*Srishti Prakriya*) according to the First Standard : the primordial motions and associations of the *Paramānus* are due to *Adrishta-sahakrita-Īshvara-prayatna*.[143]

Points to be noted are : (1) *Adrishta* of the components of the Cosmos presupposes the pre-existence of an *active* cosmic order before *Laya* or dissolution ; there is no absolute beginning. (2) God's Will is the efficient cause but it acts as the releasing force upon the latent tendencies in the dissolved cosmic order. (3) The expression of this moving force is *Kāla* or Time which is the scheme of succession of phenomena. The First Standard however, makes it a *Dravya* that is something which is independently real and self-subsisting and it is such an one not only in which, but by which, things are moved in their temporal relations, *i.e.*, ' A before B ' ;

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[143] See also the summary of the process as given by its critics, *e.g.*, Vāchaspati's Bhāmatī under Vedānta, II. 2. 10, and also Shangkara's Bhāshya under Vedānta, II. 2. 11.

'B after A'; 'B and C together'; 'D quicker than E'; 'E slower than F'; and so forth. Vaisheshika, II. 2. 9 and also VII. 1. 25 make *Kāla* a *Kārana* in relation to all things that begin and end; II. 2. 7 and 8 make it *nitya* and *eka* (*i.e.*, eternal, one, undivided). To make *Kāla anitya* (non-eternal) is to say that it has a beginning and an end. But where? In a larger Time?[144] Therefore it must be eternal *nitya*. Again, the "sections" of Time (Hour, minute and so forth)[145] are not really sections of Time itself, but they are our representation of Time according to certain conventions (Vyavahāra), *viz.*, the Sun's motion, or those of the motions of the hands of a clock. The difference and division (*Bheda* or *Khanda*) is ascribed or imposed (*Aupādhika*).[146] *Dik* is the scheme of co-existence or configuration, and is a *Dravya*, according to the First

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[144] This is Mahā-kala and Kāla as which it manifests is time as the individual centre knows it. The Kālavādins deal with the universe in terms of time. Supreme Time is a name of the Lord. And so Veda says "Time leads me in time" "Kālah kale mām nayati".

[145] Which come in with the Sun, Moon, Stars and Seasons, all forms of the Supreme Lord.

[146] See *Upaskāra* under II. 2. 8.

Standard. *Dik* like *Kāla* is a *Dravya*, *nitya* and *eka*.[147] *Dik*, therefore, is neither space nor the spatial directions, distributively or collectively. It is that by which things are made to form a definite scheme of co-existence in Space or arranged in positions in definite directions of one another. Similarly, *Kāla* is neither "Time" nor the temporal relations, distributively or collectively. It is that by which things form a definite scheme of succession. The two are thus obviously opposed to each other. By the former, the *Paramānus* are held together in a static configuration; by the latter they become dynamic, *i.e.*, are displaced and go on being displaced from their given configuration. By the first, the *adrishtas* are conserved; by the latter their static energies are rendered more and more kinetic, and the ratio of these two continually changed. Physics studies the first in its Statics the subject matter of which is Equilibrium; it studies the second in Dynamics the subject matter of which is Motion or Displacement. Biology studies them in the anabolism and katabolism of the living tissue.[148] The First

[147] (II. 2. 11, 12, 13).

[148] See the account of them in "Reality" (45-48).

Standard, in its analytical method, sets up *Dik* and *Kāla* as separate entities, and each distinct from the Self or Ātman; but it will be a more critical view to regard them not as separate things, but as manifestations of the Lord's Will by which, as the efficient cause, Paramānus are arranged in relative spatial directions as well as moved in definite succession in relation to one another. Between God's Power and the *adrishtas* of the *Paramānus* and *Ātmans* we need not interpose *Dik* and *Kāla* as separate entities. *Dik* and *Kāla* simply express a polarisation (or an opposition involved) in the way the Lord's Power seizes upon the *adrishtas* of the cosmic elements and makes them effective upon the stage of action: By one 'pole' or aspect of that Power, those which *tend* to appear on the stage *together* at a given time are actually led so to appear, and those whose tendency to appear together then is not "up to the mark" are held back. The first set have their right (*Adhikāra*) to appear, and God willing, they do appear; their precedence is not in the preference of God as before explained; it is in the degree of force with which their tendencies press themselves. This

aspect of God's Power is in Shākta Doctrine *Dik-Shakti*; its correlate pole, *Kāla-shakti*,[149] is that aspect of it by which things which *tend* to follow one another on the stage are made to do so, and things whose time is not yet are held back. These two *Shaktis* imply, condition and oppose each other. Yet like the First Standard, we need not "substantiate" them. Nor can the "tendencies" alone be left alone to fight out their cases. They require so to say an universal "vitaliser" and "prompter".[150] Comparing the cosmogenesis of Science with that of the First Standard we note that the latter admits (*a*) cyclic creation (*srishti*) and dissolution (*Laya*); (*b*) *Adrishtas* of *Paramānus* and *Ātmans* during *laya*; and (*c*) the change of this static system of stresses into a dynamic system under a transcendent act, *viz.*, God's volition. Science is dimly feeling her way to the possibility of *Srishti* and *Laya*, and therefore to the cosmic alternation

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149 "Kālo'smi Loka-kshaya-krit"—Gītā; "Kalā-kāshthādi-rūpena parināma-pradāyinī"—Chandī.

150 The subject of Tendency and Activity, the passage from one to the other, and God's Power as leading and effecting the passage, will be discussed in "Causality"

of static and dynamic conditions; but beyond this She now hardly ventures to go.

As Biology seeks to explain the rate of change (*i.e.*, growth and decay) of a living tissue by the *ratio* of Anabolism to Katabolism, so one might conceive the rate of change of the cosmic order as being determined by the ratio of *Dik* and *Kāla* which are concurrent, though variable, "forces". Thus during *Laya*, the former factor prevails, owing to which *Paramānus* and *Ātmans* remain in equilibrium: it gives a static order. During Srishti, the latter factor prevails, so that *Paramānus*, etc., move from their positions of rest, mingle in varied groups, and so on. During the continuance of the universe or *Sthiti*, the latter still exceeds (sometimes to a greater and sometimes to a lesser extent) the former, so that though the cosmic order generally persists, it moves and changes.

Next, we come to this. '*Karma*' from the standpoint of the First Standard means '*Spandana*' (Motion or displacement). Vaisheshika, I. 1. 7 classifies Motions or displacements into five kinds. Three kinds of effects are produced by Karma, *Sangyoga* (association),

Vibhāga (dissociation) and *Vega* (momentum).[151] Thus two *Paramānus* A, B associate or dissociate and receive a momentum in virtue of their motions. Now, the question is this: Is motion (*i.e.*, *Karma*) *always* produced by motion? That is, is a given motion *M* necessarily produced by another and that by another, and so on? This raises an important issue between Physics and the First Standard. The former is disposed to explain motion of one thing (say, of a ball) by that of another (*viz.* the stick's motion), this again by another (*viz.*, the hand's motion), and so on. But it is not necessarily so, according to the First Standard. Vaisheshika, I. 1. 11 and 24 lay down that motion (*Karma*) is not necessarily the cause (*Kārana*) of motion (*Karma*). It recognises that volition (*Prayatna*) is a cause of Karma, and volition, according to the First Standard, is not a motion itself. *Prayatna* is a function of the self (Ātmā), and it produces motion in the muscles of the hand, and so forth (V. 1.). V. 2. 21 forbids action '*kriyā*' in the sense of *Spandana* (vibration) in the continua—*Dik*, *Kāla*, *Ākāsha*

151 Vaisheshika, I. 1. 20.

and Ātmā. It pertains to what is discontinuous, discrete. The first creative act of the Lord on the *Paramānus*, etc., is not therefore, according to this Standard, a '*Karma*': it is an extra-physical action.

Next we ask this: Do the Paramānus involve an immanent dynamism? Severally they are not believed by the First Standard to contain immanent or intrinsic energies; but collectively they do even during the time of dissolution (*laya*). The aggregate of discrete Paramānus possesses energies (static) in virtue of their positions. These as we have seen, are the sum of their *adrishtas*. When, as explained later, by the Lord's Will,[152] their relative positions change, their static energies become kinetic. We may compare the Nebular Hypothesis of the physicists which contemplates such translation of potential energy into kinetic, and also Helmholtz' theory of the contraction of the solar mass by which the potential energy of the sun is rendered kinetic (*i.e.*, heat), and supplies in part the heat which the sun loses by radiation. Vaisheshika,[153] assigns certain

[152] (Īshvara-prayatna).

[153] V. 1. 15.

movements (*e.g.*, that of iron to magnet, etc.) to *Adrishta*; the leaping up of flames is also so explained; the movement (*spandana*) of *Paramānus* at the time of creation is also due to *Adrishta*. Comparing the examples we may infer that what is meant by '*Adrishta*' is that it is a not-commonly-apparent stress. Magnetic stresses, gravitational stresses, chemical stresses and so forth are subtle forms of stress which Yoga (including Science) may partly reveal or discover, but in all analysis an undiscovered and unexplained residuum must remain which is then the *Adrishta*. In a dissolution (*laya*) the Paramānus must have tendencies or tensions which do not produce actual movement. What it may be asked are these tensions? *Adrishta* says the First Standard, and does not go farther. But what are they in reality and how can they exist? The Second and Third Standards conceive them as energies of position. Evidently enquiry cannot stop even here; for, how can A be conceived to have energy by virtue of its position alone in a scheme A, B, C? It requires an explanation. Ultimately however an unexplained residuum must remain, because the *fact* is alogical. In the meantime, the

Second and Third Standards carry the investigation further than where the First has brought it.

What is a *Paramānu*? From the realistic standpoint of the First Standard, which does not partition the Primary and Secondary qualities, a sensible object really exists as we sense it. It *has* form, taste (*rūpa*, *rasa*), and so forth. Western Science does not admit in its atoms of matter *Rūpa* (in its colour aspect) *Gandha* or odour, *Rasa* or taste: these being secondary qualities. Now, this sensible object is made up of parts (*e.g.*, a piece of cloth). The parts have also form (*Rūpa*) and so forth. The parts have parts again. And so on. Ultimately we have the thing divided into "points". In mathematical language, these ultimate [154] parts are the infinitely small elements of the real thing. Since they are infinitely small elements of the real thing, (*a*) they cannot have a finite magnitude capable of being subdivided (in fact or in imagination); and (*b*) they, being the *minima* of the real thing, must possess the fundamental qualities (*Nitya gunas*)

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[154] Charama.

of the thing.[155] We sense a lump of earth or a piece of ice. Is that the real thing meant here of which the *Paramānus* are the minima? The lump of "earth" perceived is a compound of *Prithivī*, *Ap*, *Tejas*, *Vāyu*; it is not pure *Prithivī*. Hence *its* minima are not *Paramānus* of one kind but P's of different kinds. Pure *Prithivī* is not earth which is a compound. So pure *Ap* is not water as we find it. And yet they are not mere ideals or abstractions. They really exist and mix variously. Our senses give us complexes of sensations; we find that these sensations fall into five groups—form, taste, smell, touch, hearing;[156] our sense-experiences also give us certain permanent combinations of the first four (leaving out the fifth for the present). *E.g.*, certain objects being there, we invariably experience (provided our instruments of knowledge are normal) all the four; in other objects (*e.g.*, water or air) we may sometimes experience all of them,[157] but not always. Hence we think

[155] These are not however the Primary qualities of Science only.

[156] Rūpa, rasa, gandha, sparsha and shabda.

[157] *e.g.*, when water is perfumed, and when glowing sparks and scent-dusts move in the air.

that in the former set of objects the combination of four is natural,[158] whilst in the latter such combination is due to the admixture of adventitious elements.[159] Eliminating smell (*gandha*) we have a combination of three, and these with two others added (*viz.*, *Dravatva* or liquidity and *Sneha* or adhesiveness) make *Ap* in which the combination is permanent. We here omit the *propria* and *differentia* of *Prithivī*, *Ap*, etc.; and note the general characteristic, *viz.*, that each stands for a "permanent possibility" of a certain combination of sensations, and is a *dravya* or independent entity. Thus *Prithivī* is not earth but the permanent possibility[160] of a kind of combination of the four. So with *Ap* and the rest. It is not obviously a chemical analysis of Matter, but the classification is based upon a psychological analysis and synthesis: so the *Bhūtas* are not "Elements" of Physical Science.

Suppose now that the required combination of all the four kinds of sensations, founded in

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158 Or sāngsiddhika.

159 Agantuka.

160 *i.e.*, dravya or samavāyi kārana.

a Substance, be called P; the required combination of 3, A; that of 2, T; and that of 1 (*i.e.*, sparsha), V. Then, in all ordinary experiences of the senses, we have mixtures of P, A, T, V. But the experience of the mixture is an experience of the components. Thus we do experience P, we do experience A, and so on, though ordinarily not in freedom from the company of the others. By their mixing, which the Third Standard explains by *Trivrit-karana* or *Panchī-karana*, their qualities (gunas) variously commingle, and sometimes may inhibit one another. Vaisheshika, [161] forbids, however, the mixing called *Panchīkarana* in the sense of Vedānta. But still according to it the Bhūtas mix in a way. We shall not pause to discuss the distinction between the two, but only note that some sort of mixing [162] is allowed by the First Standard.

Hence a *Paramānu* of *Prithivī* is not an infinitely small element of what we actually experience as earth, stone, body, etc., which are all mixtures, but it is an infinitely small

[161] III. 2. 2 and 3, and VIII. 2. 4.

[162] *viz.*, as samavāyi Kārana of one and as upashtambhaka or nimitta kārana of others.

element of a substance (really existing and entering variously into compounds) which is the ground and cause of a certain permanent combination of four classes of sensation, *viz.*, smell, taste, form and colour, and touch. The infinitely small element possesses and produces the four kinds of qualities in gross (*Sthūla*) *Prithivī*. It has *Rūpa* (form colour) [163] etc., therefore; but its *Rūpa* is not *Udbhūta*, *i.e.*, such as can be apprehended by our senses. Vaisheshika, IV. 1. 6. says that *Rūpa* is apprehended when an object is *mahat* (large), consists of many *Avayavas* (parts) and has *Rūpa* in itself; then it becomes an object of visual perception. A *Prithivī-Paramānu* has the *third* quality, but neither the first nor the second; hence its *Rūpa* is not seen. IV. 1. 7 and 8 go on to show why *Vāyu*, in spite of its being large and constituted of many parts, has no visible *rūpa*, and how the mere existence of *rūpa* in a thing is not enough for its being perceived by the eye—that to be thus perceivable it must possess *Rūpa-vishesha* or *Udbhūta-rūpa*

[163] According to Indian notions all form is coloured: by its coloration it is seen as form; the colourless is also formless.

or such *Rūpa* as would bring it within the range of our normal sense-capacity. In this way, the minute pollen-dusts of scent-flowers floating in the wind excite the sense of smell but not that of sight. The *Paramānus*, according to this Standard, possess in this way *infra*-sensible *Rūpa*, *Rasa*, etc., which originate sensible *Rūpa*, *Rasa*, etc., in the gross objects of perception.

The four kinds of *Paramānus* are different as regards their qualities from one another. But the question may be asked—Are *Paramānus* of the *same* class (say, *Prithivī*) absolutely identical? Vaishesika,[164] says—No. Each *Paramānu* has its generic or class characteristics and also its own individuality.[165] If, therefore, we take the *Paramānus* A, B, C belonging to the same class, we cannot say that A=B=C. It is for ascribing such individuality to Paramānus that the Vaisheshika has been so called. Nyāya differs in this. Each *Paramānu*, by virtue of its position alone in the universal configuration, must possess, or be associated with, a stock of static, potential energy which cannot be identical with that possessed by another *Paramānu* in

[164] II. 2. 6.

[165] Vishesha.

a different position. These distinct separate stores of static energy are *adrishtas.* This word means "that which is unseen" and which for practical purposes [166] is synonymous with *Sangskāra* or tendency and aptitude in its unmanifested form which is the product of previous action or *Karma.* We shall see also that the first movement [167] of the *Paramānus* is due to *Adrishta* [168]. Now, the *Adrishta* of a given *Paramānu* constitutes in a way its individuality; [169] but has it (say, A) also an individual form or taste [170] as compared with another *Paramānu* of the same class (say, B)? The parallel case is that of the allotropic modifications in Chemistry. Coal, Graphite and Diamond are all allotropic modifications of carbon—they contain nothing else than carbon atoms. And yet their physical properties are so markedly contrasted. How can that be if the matter in them be the same? Now, in order that two

[166] Sometimes the terms are used synonymously, in others a distinction is made. Postponed Adrishta is Sanchita Karma.

[167] Ādya Karma.

[168] See V. 2. 13.

[169] Or Vishesha.

[170] Vishesha rūpa or rasa.

things, A and B, may be the same, we must have (1) A's matter equal to B's matter, and also (2) the arrangement of A's matter similar to the arrangement of B's matter. Charcoal and Diamond are not the same because, though the first condition of similarity is there fulfilled, the second condition is not. Matter is differently *arranged* in them. But why; and what does that presuppose? Ultimately the difference must be explained in terms of the dynamisms of A and B; the forces (*shakti*), static and dynamic, which operate in the one are different from those which operate in the other; their stress-systems are different. According to modern Chemistry, all forms of Matter are really the allotropic modifications of one another, since they are now believed to be only different arrangements of a fundamental Matter—"Protyle" or Electron or Ether or whatever else we may call it. Oxygen and Hydrogen, for example, are only different arrangements of Electrons. These different arrangements are the individualities (relatively stable) or *Visheshas* of the chemical "atoms". And these are ultimately determined by the immanent stress-systems of the atoms. Science

denying the "secondary qualities" in the atoms and corpuscles cannot say that O has a form or taste[171] different from that of H; but it does say that it has a different weight, mass and constitution. But suppose we take two atoms of O itself. Is there any difference between them as distinguished from that which they must have on account of their different positions in the material system? Science is not yet ready with an answer; but if it be true, that atoms are complex systems and not simple, partless units, then, *à priori*, two atoms of the same element ought to have their individualities (*Visheshas*) over and above their typal or generic similarity. We are all individual men though belonging to the same type Man. So it ought to be with the atoms of the same "element" (say, Oxygen). Nor can we avoid such individuality in a sub-atom or electron, for even this, having a definite mass and dimensions, cannot be an absolutely simple thing; it is likely that they are also systems in their turn. Hence Science cannot avoid the *Vishesha* or individuality in her current units of Matter.

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[171] Rūpa or rasa.

But the *Paramānus* are partless points of Substance. Hence it may be argued (as it has been argued by the Naiyāikas and others) that their only *Visheshas* can be their differing *Adrishtas*, but that otherwise they must all be equal; *i.e.*, one *Paramānu* of Prithivī cannot have a form [172] different from that of another *Paramānu* of *Prithivī* (earth). The Vaisheshika Text does not appear to make the point clear, but since the Vaisheshika conception of *Bhūta* is based upon a *psychological* analysis of our actual experience of Matter (the "element" thus obtained being substantialized) rather than upon a physico-chemical analysis, it ought to follow that the irreducible minima of Matter thus obtained are really the counterparts of the actually perceived forms of Matter on a miniature scale. Now, some of the actually perceived forms of Matter have not only form (*Rūpa*) in general but individual forms (*rūpa-visheshas*), *e.g.*, this white paper and that green leaf. [173] Suppose a Paramānu of the paper be A and that of the leaf be B. Suppose also that

[172] Rūpa.

[173] Papers and leaves also may be of different shades of whiteness and greenness.

they are both *Prithivī Paramānus.* Then, since A and B are the irreducible minima of the paper and the leaf as actually perceived by us, the *Rūpa-Vishesha* of A ought to be that of the leaf. Though both are *Prithivī Paramānus* they have their special forms (*Rūpas*), and the different *Rūpas* of the paper and the leaf are caused by the special *Rūpas* of A and B respectively. Such representation is psychologically correct. We start with the actual perceptions of paper and leaf; we go on dividing and subdividing until the mind halts at the *minimum psychosis* (or "Psychon" to use the expression employed in the Text and in a recent English work); and then this Psychon is treated objectively; and so we get the Paramānu. *Pari passu* with such analysis, a physico-chemical analysis of the paper and the leaf may be attempted; and in the progress of this latter analysis we soon come to a stage when the subdivisions or segments ceasing to possess *perceptible* colour, taste, smell, etc., disappear, and only *indirect* evidence is left of the existence of weight, resistance, motion, etc., in the particles. Now, when this stage in the analysis has been reached, there are evidently

two ways of proceeding: (*a*) We may either say that the subdivisions which come beyond our limit of perception are similar to those which are perceived by us—that the ultimate particles are therefore our minima of Psychosis objectified, and hence each having its own *Vishesha*; (*b*) or we may say that since colour, etc., disappear in the progress of the analysis but evidence of weight, inertia, etc., is still left, these latter alone are the real properties of Matter, so that if, for example, paper and a leaf are visually sensed by us differently, that is not because the atoms of the two (*i.e.*, A and B) actually possess the different colours or any colour, but because the former atom (A) is moving in way different from that in which B moves and excites our sensibility. The former is the concrete, psychological view and it is that of the vaisheshika. The latter is the scientific view which, in so far as it stows apart Primary and Secondary qualities, is abstract and unpsychological. But even after spiriting away the secondary qualities, Science has got to consider this: A and B (say, atoms of the same "element") possess weight, inertia, etc.; but do they not possess differing weight,

inertia, etc.? That is, has not each its own *Vishesha* as regards the primary qualities at least? *Prima Facie*, it ought to have—even the Electron.

Next comes the difficult question of the magnitude of the *Paramānu*. To meet this question one has to free one's mind of the notion that the Paramānu is something like an "atom" or an "electron". These latter, as we have seen, have definite magnitudes. But *Paramānu's* magnitude is infinitely small. Vaisheshika, VII. 1. 20 calls the measure (*Parimāna*) of the *Paramānu* "*Parimandala*," and this magnitude is permanent (*nitya*). But what is this *Parimandala*? Literally it means a "sphere". It is therefore an infinitely small sphere, or a "point". As already stated this Standard contemplates, *four* kinds of Magnitude—(1) Anu, (2) Mahat, (3) Hrashva, and (4) Dīrgha. The first is 'small,' the second 'large,' the third 'short,' the fourth 'long'. It also considers (VII. 1. 11 and 17) these two pairs of categories as giving rise to two series (Dhārā, *e.g.*, A is smaller than B, B than C, C than D, and so on. This is one series. A is shorter than B, B than C, and so

on. This is another series.) Now, obviously, each series has a superior limit (*utkarsha*) and an inferior limit (*apakarsha*), *e.g.*, in the first series, A may have the smallest magnitude and Z the largest. A then is the inferior limit, and if it be absolutely small magnitude, then it is the *Paramānu*. Similarly Z is the superior limit and *Parama-mahat* (*e.g.*, Ākāsha, Ātman —VII. 1. 22). Between these two limits we shall have several orders which are relatively great or small. If the *Paramānu* had any finite magnitude, however small, like the scientific atom or electron, then it would not be the inferior limit—the "partless" unit. Hence the infinitely small unit is nothing greater than a Point (Bindu). The same reasoning will apply to the other pair "short-long". The infinitely short thing is again a Point. If it had any finite length, it would be divisible. So the inferior limit of the second series is also the *Paramānu*. It is a '*parimandala*' because it is a sphere of which the radius is infinitely small, *i.e.*, a Point. Things of perception are seen to be divisible into smaller and smaller grains or particles. All these are spheres of finite

(however small) radii. So are even the Electrons. Pushing to the limit we get a sphere of which the radius is infinitely small, and this is *Pārimāndalya.*

'Anu' and 'Mahat' are terms which relate to solid or three-dimensional magnitude, and '*Hrashva*' and '*Dīrgha*' to linear magnitude. Now, there are as already stated *six* possible combinations of these four terms taken two at time: (1) *Anu-mahat*, (2) *Anu-hrashva*, (3) *Anu-dīrgha*, (4) *Mahat-hrashva*, (5) *Mahat-dīrgha*, (6) *Hrashva-dīrgha.* Of these the first and the sixth combine contraries,[174] and so they are cancelled. The third is also untenable, because a thing which is small in dimension cannot be *Dīrgha.* Similarly, a thing which is large in dimension cannot be *Hrashva*, and therefore the fourth combination is also untenable. Only the second and the fifth are logically tenable combinations.

Now, suppose we join together two Points or Paramānus. What do we get? A short *line* of which the breadth and thickness, (*i.e.*, solid dimension) are infinitely small. Yet the thing

[174] VIII. 1. 10.

thus obtained is not a *Paramānu.* Because the magnitude of *two* points put together must be greater than that of a single one. By combining the two points (not coinciding them, however) we get a very short line (of which the solid dimension is nothing)—the "element" of linear dimension, as it is called in Mathematics (*Dl* in mathematical notation). How shall we characterize it? It is *Hrashva* as well as *Anu* (because lacking solid dimension)—*Anu-hrashva.* This is the magnitude of the binary or *Dvyanuka.* It is an "element" of linear dimension.

Suppose next we combine two such elements of linear dimension—two binaries or *Dvyanukas.* From a common "origin" or point of reference, we draw two short lines in two different directions. What do we get? An "element" of *surface* dimension—a very small surface (*Ds* in mathematical notation). If we draw from a common origin *three* such short lines (say, at right angles to each other), we get an "element" of solid dimension or volume (*Dv* in mathematical notation). Three *Dvyanukas* make in this way a *Trasarenu* (lit. a moving particle). *Its* magnitude is much greater than that of a *Dvyanuka,* for the *Trasarenu* has a

breadth and a thickness whilst a *Dvyanuka* has neither. Hence, compared with the *Dvyanuka*, it is *mahat*. Again, many lines must be bundled together (like slender wires twisted together into a rope) to produce even a very small volume; each of the constituent lines is short, but the aggregate of these short lengths is comparatively *Dīrgha*. Hence we may say that the magnitude of the Trasarenu is *Mahat-dirgha*.

In all Physico-mathematical analysis of things in Science we have to imagine and deal with the "volume-elements". A mere point, or a mere line cannot be an object of concrete imagination for us—we cannot "perceive" it with the eye of imagination. Such "perception" becomes possible only when we take a solid-element. If we had the requisite sense-capacity, we could actually perceive such a solid-element however small. The *Trasarenu* therefore is the true "corpuscle" or "particle" of Matter. It is perceivable provided the requisite sense-capacity be there. At any rate it can be actually *imaged*, and since according to Hindu Philosophy it possesses both primary and secondary qualities, it can be *concretely* imaged by us. The chemical

"atom," "electron," etc., being larger or smaller solid-elements fall under the generic category of *Trasarenu*. They cannot be either Paramānus or Dvyanukas. They are theoretically perceivable by us, provided the secondary qualities are also left in them. *Paramānus* or *Dvyanukas* are not *thus* perceivable or imaginable by us. This is the meaning of the teaching of the First Standard that when the Trasarenu stage is reached, the combination becomes fit for perception (*Pratyaksha-yogya*). The combination as we have seen is geometrical and not chemical—it is the putting together of the three dimensions.

It has been observed in a previous section that this has not been quite well grasped by the latter-day annotators of the First Standard who in some cases possessed neither the Yogic vision (Yoga-drishti) of the seers (Rishis) nor all the advantages of modern Science. In some cases, their common sense treatment has missed the real points. Similarly [175] a profound scientific wisdom has been said to underlie the matter presented in the Veda-mantras

[175] See P. N. Mukhyopādhyāya's Bengali Lectures on Veda and Vijnāna.

even in the ritual section (*Kriyā-Kānda*). But it lies concealed, and later interpreters have not always uncovered it. In the annotations, the *Trasarenu* is often represented as a moving particle of matter visible to the eye when, for instance, a pencil of sun-beam is let into a dark room through an aperture. Like a larger ball made up of six smaller ones, it can be broken up into six *Paramānus* or three *Dvyanukas*; so it is said. But this is absurd, and this is not the position of the First Standard. Even a microscopic particle must contain multi-millions of "corpuscles"—says Science. It may be so, says the First Standard; its *Trasarenu* being, as we have seen, only the "element" of solid dimension which embraces the scientific corpuscles, etc. The First Standard then proceeds to analyse Matter from the *psychological* standpoint, though the elements thus obtained by it are treated objectively and rigidly by it. This should be remembered when one has occasion to compare it with Western Physical Science.

Vaisheshika[176] in a number of Sūtras indicate the natures of *Prithivī*, *Ap* and the rest. We

[176] II. 1 and 2.

have seen that each is a permanent possibility of a certain combination of sensations (or objectively, qualities or *gunas*). Later commentators have taken pains to show that *Prithivī* is nearly what we know as earth, that *Ap* is water, and so on; and so the definitions or *Lakshanas* have been complicated. *E.g.*, *rūpa*, *rasa* and *sparsha* in *Prithivī* are given special meanings.[177] We need not here discuss the details. We may simply observe that we cannot be far from the mark if we say that *Prithivī* (earth) stands for (*a*) Rigidity (or relative definiteness and stability of form), and (*b*) a certain combination of the four kinds of *gunas* (*gandha* or odour being its speciality). *Ap* "water" stands for (*a*) Liquidity and Adhesiveness, and (*b*) a certain combination of the three kinds of *Gunas* (omitting *Gandha*).[178] *Tejas* stands for (*a*) Radiations (Heat, Light and Electricity)[179] and (*b*) a certain combination

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[177] Aneka-rūpa-vattva, aneka-rasa-vattva, pākaja-sparsha-vattva.

[178] II. 2. 5 adds "shītatā" or 'coolness' also a sangsiddhika Guna to Ap.

[179] V. 2. 9 and 10. As the Vyāsa-Bhāshya on Pātanjala-darshana (III. 44) says: "Mūrtir bhūmih, sneho jalang, vahnirushnatā, vāyuh pranāmī, sarvvatogati-rākāsha iti."

of *Rūpa* and *Sparsha*. *Vāyu* stands for (*a*) Fluidity and Mobility, and (*b*) a certain kind of *Sparsha*. *Ākāsha* stands for (*a*) a continuous *plenum*, and (*b*) Shabda which,[180] cannot be an intrinsic *proprium* of those objects which have 'touch'.[181] *Shabda* however is here used in the sense of 'sound' and not *Spanda* or motion which is *Karma* according to the First Standard.

To sum up: *Prithivī* ("earth") is *rigid* matter; *Ap* ("water") is *liquid* matter; *Tejas* ("Fire") is radiant matter; *Vāyu* ("air") is *fluid and mobile* matter; *Ākāsha* ("ether") is ethereal matter. These may be taken as broad *lakshanas* or definitions. *Ākāsha* or ether in the First Standard is not conceived as Space, but as an infinitely continuous *plenum* of which the quality or *guna* is sound (*shabda.*)[182]

If we remember that Vaisheshika makes sound (*shabda*) the *guna* and not the motion (*karma*) of Ākāsha, then the apparent discrepancy between it and Science as regards sound

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[180] As II. 1. 25 explains.

[181] Sparsha-vatām.

[182] That Ākāsha is not mere space is indicated in II. 1. 20, etc.

will disappear. *Karma* is motion (displacement), vibratory or otherwise. Science, explaining sound as being caused by the vibrations of Air, makes it motion (*Karma*) of Air. Now, sound being a secondary quality is subjective from the standpoint of science; the vibration of Air being the cause of sound, but not sound itself. But suppose we objectify or externalize sound itself—we take it as existing outside of us as sound. Doing so we find that like form, touch (*rūpa*, *sparsha*), etc., it is not confined to particular, limited objects. *Rūpa* or *Sparsha* is where the object itself (*e.g.*, a conch-shell) is; it is not where the object is not. Odour travels away from the object (*e.g.*, of a flower), but then we have positive evidence there that minute particles of the object itself have travelled and carried the smell along with them; so in smell too we may say that it is where the object is (the flower or its particles). But the case of sound is different. The sound of a conch-shell blown is *not* necessarily where the conch-shell is; it may be heard in different directions and in different positions; several people in different positions may hear it together or nearly together. There is no evidence that,

as in the case of smell, particles of the conch-shell themselves have travelled; and even if they did, they could not carry the sound of the shell; for, as is rightly pointed out,[183] the sound of a lyre or flute is not in the particles of them taken distributively, as the smell of a flower is. Hence if we accept the maxim that the qualities of a thing cannot be where the thing is not, we must say that sound must be the quality of a substance which is large and continuous. That sound takes time to travel and therefore persons at distances from one another do not hear a sound at the same moment, proves only that sound has an efficient cause[184] which is the propagation of atmospheric vibration.[185] But the material[186] cause of sound is the *continuum Ākāsha*. *Shabda* is thus the quality (*Guna*) of Ākāsha, but is revealed and propagated by the *Karma* (*i.e.*, *Spanda*) or motion of *Vāyu* or air.

Concluding we observe this: If like Western Science we define Matter as that which moves

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[183] II. 1. 25.

[184] Nimitta Kārana.

[185] This is recognised in the First Standard; see Bhāshā-parichchheda and other works.

[186] Samavāyi.

(in the sense of displacement), then, from the view-point of the First Standard, all *Dravyas* or independent entities which have *Karma* (*i.e.*, *spandana*) or movement are Matter; and they are—*Kshiti* (earth), *Ap* (water), *Tejas* (fire), *Vāyu* (air), and *Manas* (mind). V. 2. 12 and 13 say that all these (including *Manas*) have Karma. And V. 2. 21. says that *Dik*, *Kāla*, *Ākāsha* and *Ātman* are *Nishkriya* (*i.e.*, do not have *Karma*). V. 2. 14 also separately assigns *Karma* to *Manas*; this can be moved by effort (*Prayatna*) and also by external stimuli. The *Indriyas* or senses are also material. VIII. 2. 5 and 6 show that the sense of smell is *Pārthiva* ("Earthy"), that of taste is *Jalīya* (watery), that of vision is *Taijasa* (fiery) and that of touch is *vāyavīya* (ærial). *Shrotra* or that of hearing is simply a portion of Ākāsha cut off by the ear-membrane, such cutting off in a given manner being due to *Adrishta*.[187] It is not therefore a *parināma* (transformation) of a substance like the eye, etc., but it is the pure substance itself (*i.e.*, *Ākāsha*) bounded by the ear-membrane.

[187] "Vishishtādrishto-pagrihīta-karna-shashkulyavachchhinno nabho-desha eva shrotram."—Upaskāra.

§ 11

All philosophies attempt to trace the causal series in the world to the ultimate root or roots. Of these some proceed on the straight path which is the psychological method (*i.e.*, analysing actual experience), and others choose a round-about path. The method of all the three standards of Hindu Philosophy is *psychological*; their difference lies in the *extent* to which the investigation has been pushed. The First Standard carries its investigation to the *Paramānus*, *Dik*, *Kāla*, *Adrishta* and *Ātman*. By it these are (except *Adrishta*) presented as separate entities. Indeed so we must take them if we do not or cannot push our investigation farther.

But suppose we are able to go farther. We ask this: A *Paramānu* is a Point of Substance, which though simple and partless, possesses a cluster of permanent *Gunas* (*Rūpa*, *Rasa*, etc.), has its own *Vishesha* or individuality, and has also its *Adrishta*. Is it conceivable that a *thing* which is absolutely simple and partless can have a *Rūpa-vishesha*, a *Rasa-vishesha*, a *Gandha-vishesha*, a *Sparsha-vishesha ?* Its *Gunas* and *Karmas* form a complex whole; can the

basis of this complex whole be a simple point of substance? Shangkarāchāryya in Vedānta, II. 2. (11-17), gives an exhaustive and able criticism of Paramānu-kārana-vāda. His criticism principally relates to (*a*) the possibility of *first* motion in the *Vāyavīya* (ærial) *Paramānus* at the time of creation (*sarga*); (*b*) the manner of their association; and (*c*) their simplicity in spite of the complexity of their *Gunas*. We need not go into the details, but only observe that the complexity of *Gunas* and *Karmas* in a *Paramānu* renders it impossible that the basis can be but a Point-Thing. On similar grounds Western scientists felt dissatisfied with the "simple and hard" atoms even when positive evidence of the electron was not forthcoming. Difference in weight, valency and other chemical properties, spectrum analysis and various other things suggested the complexity of the atom.

Therefore, why not say this—A *Paramānu* is a complex thing whose elements (*Avayavas*) are the *Rūpa*, *Rasa*, *Gandha*, etc.? Instead of saying that Paramānu is a simple X possessing the complexus of gunas, A,B,C,D, with all their *Visheshas*, we say that *Paramānu* is a

whole of which the elements are A,B,C,D. The Paramānu=A+B+C+D. In this way, (1) simplicity in the thing and complexity in the *Gunas* and *Karmas* as postulated by the First Standard vanishes; (2) the necessity of an extra-mental support of *Rūpa*, *Rasa* and the rest is obviated; and (3) the method becomes more psychological, and new vistas of psychological analysis open before us beyond the *Paramānus*. The elements of *Rūpa*, etc., which constitute the *Paramānu* are the *Tanmātras* or Generals of the sense particulars of the Second Standard. So instead of saying *Kāla* and *Dik* are *entities* which make the *Paramānus* and their aggregates appear in orders of succession and co-existence, we may simply say that the former is the sum of the movements (m^1, m^2, m^3, etc.,) or *Kshaṇas* [188] of the Tanmātras, and the latter is the sum of their relative positions (p^1, p^2, p^3, etc.). The mystery why things move variously and occupy various positions is not cleared up merely by saying that there are

[188] A 'Kshana' or Moment is a partless unit of time and is measured by the transit of one Paramānu (or Tanmātra) from one position in Space to another. See Pātanjala, III. 52.

entities to make them do so. Thus, the Second Standard simplifies matters by these three equations: (1) P (Paramānu)=A+B+C+D; (2) K (Kāla)=$m^1+m^2+m^3+$ . . . ; (3) D (Dik)=$p^1+p^2+p^3+$ . . .

But by these Equations the Problem itself is not solved. By them we have merely shaken off needless encumbrances, which however *are* useful frame-works for arranging the world-phenomena in the first instance. The *Tanmātras*; their nature, distribution and change; give us a complicated whole which *prima facie* cannot be the ultimate order, and which therefore requires and stimulates further enquiry. Such enquiry is undertaken by the Second Standard by making us pass through *Ahangkāra*, *Mahattattva* and *Mūla-Prakriti*.[189]

It is not necessary here to deal in full with *Ahangkāra* and the rest.[190] But the trend of the investigation of the Second Standard is clear: (*a*) Having reduced Matter to complexuses of *Tanmātras* which are Generals of the

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[189] The I-making principle derived from the mind in its fundamental aspect as Buddhi again derived from the Root of both the psychical and material.

[190] See "Mind" in this series.

Sense-particulars or Universals, it recognises the basis of Matter in the Mental Principle, or rather a Principle which, in having to evolve as sensible Matter, has first to evolve as the Mental Principle. (*b*) The first Standard had left even at the beginning a heterogeneous order, *viz.*, *Paramānus*, their *Gunas*, *Adrishtas*, *Dik*, *Kāla*, *Ātman* and the rest. But the Second Standard is able to trace all this heterogeneity to a homogeneous unconscious Root (*Prakriti*) which, however, it still leaves tripartite (as being constituted of *Sattva*, *Rajas* and *Tamas*[191] and as being distinct from consciousness as *Chit* or *Purusha*). This tripartite "homogeneous" Root as being the object "seen" by Consciousness, is the Primordial "Mind" and Primordial "Matter" which first evolves as *Buddhi*, then as *Ahangkāra*, then as *Tanmātras* and lastly as the particles of gross matter or *Bhūta*. Thus this system makes the mental precede the material, the universal precede the particular, the homogeneous precede the heterogeneous.

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[191] Power (Shakti) as presenting, veiling consciousness and the activity in each.

It also conceives the world-process as an unfoldment or Evolution.

Pātanjala Darshana, III. 44 speaks of the *five* conditions of the *Bhūtas*. (1) *Sthūla*. The actually perceived condition involving *Gandha*, *Sparsha*, etc.; each perception gives a particular form of *Bhūta* with a particular set of qualities. (2) *Svarūpa*. The *generic* quality (*jāti*) of the five kinds of *Bhūta*; the generic quality of *Prithivī*, of *Ap*, *Tejas*, etc. (3) *Sūkshma*. The *Tanmātras* which are the *units* or causes of the *Bhūtas*. (4) *Anvaya*. The three *Gunas* (*Sattva*, *Rajas* and *Tamas*) which underlie and constitute ultimately all *Bhūtas*. (5) *Arthavattva*. The end for which each form of *Bhūta* exists and evolves; the *Bhūta* as an object or instrument of *Bhoga* or enjoyment. He who can do concentration or Samādhi on these five conditions of *Bhūta* can control it.

We have said that the *Tanmātra* is the unit of the *Bhūta*. In what sense? The *Tanmātra* is called *Avishesha* (non-particular) in the Second Standard (*e.g.*, in Pātanjala, II. 19). It is called also the *Sūkshma Bhūta*. The etymology of the word would suggest that it is the unit, or standard, or archetype. I see

whiteness in this paper or greenness in that leaf. Is that the *Rūpa-Tanmātra*? Is it any kind of sensation or quality apprehended ordinarily by the senses? No. To be *Avishesha* it must not be any particular variation of *Rūpa*, but the Rūpa as a Universal; to be a standard or archetype, it must not be *Rūpa* as apprehended variously by various limited sense-capacities but as apprehended by a perfect or "Absolute Eye".[192] To be *Sūkshma*, it must not be *Rūpa* as seen by me in this paper but as existing in the "elements" of the paper. That is, it must be elementary *Rūpa* appearing, within the limits of man's sense-capacity and subject to his inherited tendencies or *Sangskāras*, as the *Rūpa* of this paper.

Suppose we make this hypothesis. Let this paper be divided and sub-divided till at last the non-magnitudinal "points" are reached; and let a Perfect Sense (*i.e.*, free from the limitations of varying tendencies or *Sangskāras*) apprehend those points. Then, to such a sense (say, the eye) there will be presented standard

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[192] *Cf.* Plato's doctrine of Archetypes.

"Rūpa-points". A Rūpa-point is an "atom" of *Rūpa* or an infinitely small element of *Rūpa* as apprehended by a Perfect Eye. Similarly, a Shabda-point is an "atom" of Shabda; and so on. Each is a sort of ideal or standard "Psychon"; and there are obviously five kinds of Psychons involved in the constitution of sensible matter. In the Second Standard we discard non-mental supports of the gunas, *viz.*, the *Paramānus* of the First Standard. Hence, now, this paper, for example, is *just* the aggregate of *Rūpa*-points, *Rasa*-points, *Gandha*-points, etc. As the physicist now explains Matter by "atoms" of Electricity (or Electrons which, however, cannot be the ultimate units), so Sāngkhya reduces Matter to an aggregate of psychons which, from its view-point, are *standard* elements of *Rūpa*, etc., as presented to a Perfect Eye.

As Psychons they are obviously not reducible to one another. A *Rūpa* is not a kind of *Rasa* or a kind of *Shabda*. In synthesising from the psychological standpoint the world of sensible Matter we cannot come to a number of distinct classes less than five;[193] the five *Tanmātras* are

[193] As was recognised by J. S. Mill in his "Logic".

the five irreducible minima of categories within which our experience of sensible Matter can be summed up. Though differing as *effects*, they may however agree as regards their *causation*, *i.e.*, they may *all* be deduced from the differing activities of *one* higher Principle (*e.g.*, *Asmitā* or *Ahangkāra*, the I-making or individualising principle by which a limited centre recognises itself as such).

In passing through the "refracting and defracting media" of our limited and varied individual *Pangskāras* pertaining to our instruments of perception, these *standard Rūpa*, *Rasa*, etc., become in effect infinitely diversified; so we experience almost limitless kinds of *Rūpa*, *Rasa*, etc., which change and pass, and differ from case to case. Behind all this kaleidoscopic changes of form, etc., we have the standard *Tanmātras* themselves and their permutations and combinations. These are the "things-in-themselves". It is clear that the *Tanmātras* are the Generals or Universals of which *our* perceived *Rūpas*, *rasas*, etc., are the aggregates and particular variations.

As, again, the Electrons by their number and various arrangements are believed to constitute

the atoms of Matter, so the *Rūpa*-units, *Rasa*-units, etc., by their various combinations make the *Bhūtas* or sensible matter. Whilst a *Shabda-Tanmātra* may exist singly, a *Sparsha-Tanmātra* is commonly a compound of *Sparsh* + Shabda; so a *Rūpa-Tanmātra* is=Rūpa. T. + Sparsha. T. + Shabda. T.; so Rasa T. is a combination of 4; and Gandha. T. is a combination of 5. By reason of such combination, they possess, in the above-mentioned order, 1, 2, 3, 4, 5 *Gunas*.[194]

Whatever the original Datum or Stuff may be, whether *Chit* or *Prakriti*, it is clear that we can have "points" of *Rūpa*, etc., in it, only after some Individualizing Principle (*Ahangkāra*) has operated upon it; by such operation separated Centres of Action and Reaction appear in the Continuum. The Individualizing or Centre-referring Principle is *Asmitā* or *Ahangkāra*. The whole operation again presupposes, and is resolvable into, three concurrent activities which the Sānkhya calls *Sattva* (Presentation), *Rajas* (Movement), and *Tamas* (Veiling). *Chit* or Consciousness stands apart but lights up the whole show.

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[194] See Pātanjala, Bhāshya, II. 19.

§ 12

We need not further examine this doctrine here, but only observe that *its* investigation into the foundations of Reality is also halting. If we conceive the *Tanmātras* as ideal points of *Rūpa*, etc., then *where* do these points exist and operate? In *Ākāsha*? But *Ākāsha* as perceptual Space is not antecedent to the *Tanmātras*. *Dik* as a *nitya dravya*, and as a Principle of configuration, is not admitted. It is simply the aggregate of the directions in which the points stand to one another. What then is the required *continuum* for the points to exist and operate in?

Why not say simply with Vedānta that it is Consciousness (Chit) which in one aspect of Its Power (Māyā-Shakti) evolves as Object (*Dṛishya*) and in another aspect (Chit-Shakti) manifests and controls it as Subject (*Drashtā*)?

Then this Chit Itself or Pure Consciousness will be the required Continuum, and one which is self-revealing (*svaprakāsha*). All operations and all operatives and all operators will be then the conditions of Consciousness Itself.

Dik, Kāla, Ākāsha and Ātman will only be the *Chit-continuum* or Consciousness (*Chidākāsha*)

in different attitudes and relations. Chit or Pure Consciousness or Spirit is the subject of a future volume.

As before pointed, the *Continuum* has a static (quiescent) and a dynamic (stressing) aspect. The second does not cancel or suppress the first. When the *Chit*-Substance as Energy (Shakti) evolves as the world, Its static or quiescent form is *also* maintained. This is the significance of the Kālī-Mūrti—the figure of the moving Kālī Shakti on the corpse-like (*Shava*) quiescent form of Shiva—a common symbol in the Tantras.

In Its evolution as Energy (Shakti) the Series (Dhārā) with its superior and inferior limits explained before applies. So that we have higher and higher *continua* and lower and lower *discontinua*. The perfect limit of the continua is Pure Chit, and the lowest limit of discreteness is the *Bindu* as a form of Supreme Energy. While Energy concentrates[195] into Bindus, Its continuous forms also exist as "fields" for the operation of the Bindus. Hence if Shakti to operate as and through Points requires Dik and

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[195] that is becomes as it is Ghanībhūta.

respectively; psychologically, they are responsible especially for Rūpa, Rasa, Gandha *(all in general)*. And it should be borne in mind that in the two higher standards (and more particularly in the third), psychism is = dynamism; they are only aspects.

We have taken the Absolute Sensibility and presented to It *Shabda* as *continuum*, *sparsha* as *continuum*, etc., and obtained pure *Ākāsha-Tanmātra*, etc. We might have as well begun at the other "pole" or the Point.

Because Prajāpati or Hiranya-garbha as Absolute Sensibility knows *Shabda-Tanmātra*, etc., it must not be thought that His knowledge is restricted to the pure Universals only. He is *sarvvajna* and *sarvva-vit*.[196] His Sense is the Ideal Limit of our senses: He thus *transcends* us; His sense is the aggregate of our senses: He is thus *immanent* in us.

In explaining (2), (3), etc., we have seen that the higher principles necessarily enter into their derivatives, so that in Prithivī-Tanmātra, for instance, the characters of the four

[196] As Sarvajna He is knower of the Universals or generals of the sense particulars; as Sarvavit He is knower of the particulars.

higher principles are involved. This is as it should be. But *further* compounding is necessary (which is called Trivritkarana or Panchīkarana) to get the Sthūla Bhūtas, or sensible matter, which is the subject of physico-chemical science.

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